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HEALTH AND HAPPINESS

A MESSAGE TO GIRLS

HEALTH AND HAPPINESS

A MESSAGE TO GIRLS

FROM

ELIZA M. MOSHER, M.D.

Member American Medical Association; Lecturer on Special Anatomy, Physiology and Hygiene for Women, Chautauqua School of Physical Education; Formerly Resident Physician to Massachusetts State Reformatory Prison for Women; Professor of Physiology and Resident Physician, Vassar College; Women's Dean and Professor of Hygiene, University of Michigan; Lecturer on Hygiene, Adelphi College, Brooklyn, etc.

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To

ALL GIRLS

WHOSE AMBITION IS TO LEAD A HAPPY, HEALTHFUL, USEFUL LIFE, I AFFECTIONATELY DEDICATE THESE LETTERS CONCERNING

A GIRL'S WELFARE

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FOREWORD

Every teacher of girls is confronted with the need of her pupils for adequate instruction in personal hygiene, and yet there is probably no subject in which teachers are less well fitted through professional training.

Dr. Mosher is peculiarly qualified to assist both teachers and pupils in this field. Holding for years a position of distinction in the medical profession, having intimate association with young women, as instructor in one women's college and "Dean of Women" in another, training teachers through many successive seasons in the "Chautauqua Summer School of Physical Education," and possest of a rare talent for friendship, whereby she has come intimately into the lives of hundreds of girls and young women—Dr.

Mosher knows not only their needs, but how to interest and approach them.

Never has the health of women been put to such great tests as in the present era of social evolution. Whether seeking it or not, practically every woman to-day feels the intense pressure of an enlarging, rushing, and complicated life. Her endurance and adaptability are challenged to the utmost, whether her life be purely domestic, whether it reaches out to the interests of the community, or whether it takes her into professional activities. Will she be equal to the strain? Can she carry her part with sweetness, and cheerfulness, and the poise of spirit that exists only with a good physique? The answer will depend immeasurably on her use of such teaching as this book gives.

JESSIE H. BANCROFT,

Assistant Director Physical Training,
Public Schools, New York City.

PREFACE

DEAR GIRLS:

Some years ago a girl friend of mine went to Dr. Mosher for advice. She had headache a great deal; she was awkward, had bad breath, and was generally too wretched to do her school work. She did not need medicine, she needed advice. Dr. Mosher taught her how to stand and walk, and to live so that she was both stronger and healthier, her digestion good and her breath sweet. She was nice all through.

This set of letters from Dr. Mosher has in it what this girl learned. It is true, sincere, important, and not in the least cranky or over emphasized. I hope that you will read it, and that you will like and profit by it.

With best wishes,

LUTHER H. GULICK.

INTRODUCTION

To Mothers:

Dear Friends—

My object in writing this short series of letters has been to impress upon girls and young women the great importance of an intelligent management of the human body.

You and I remember how difficult it was for us to understand, when we were young, why our mothers and teachers tried so hard to guard our health, and how rebellious we felt when they curtailed our activities in order to protect it. Some girls, who were not thus carefully watched over, had many hard lessons to learn in the school of experience.

The persuasive power of knowledge regarding the structure and functions of the various parts of the human body is very

great; because of this I have based my teaching upon it in these letters. It is my desire to convince girls of the importance not only of becoming familiar with the laws under which the body does its work, but also of forming the habit of considering these laws in making the daily choices and decisions by which all lives are shaped.

To you, Mothers, whose desire and high privilege it is to start your children on the road of life with all the helpful habits possible, I would like to write a few suggestive words regarding some of the subjects considered in these letters to girls.

In reference to body symmetry: most children retain until the age of six or seven the perfect body shape with which they were endowed by nature; with a little careful home training they need not lose this symmetry. May I suggest that a the age of four of five you should beg

with what I call my "One, two, three, four position drill"? You will find the rules in the latter part of the fourth letter. Make a little home play of it, which if often repeated, will cause them to form the habit of correct standing, sitting and walking. To this may be added a march through the house, up stairs and down, with a light book resting upon the head; let them sit down, rise, and even run without allowing it to fall; it is well frequently and carefully to measure their height, and by placing a mark on the wall, showing gain, as an incentive to children to keep the body erect and the head high. If their father would occasionally ask them to show what you mean by "position" and express approval it would stimulate them to greater effort in this direction.

Never tell a girl to "throw the shoulders back." Even to tell her to "raise

the chest" is unsafe, because in attempting to do either she is likely to thrust the spine too far backward at its upper part, thus exaggerating the lumbar curve and producing a weak back. Instead, direct her to raise the head high (chin in), and at the same time drop the pelvis *a little* in front. With the good-bye kiss, as she starts for school, the command "position" should often be given, not only to the little kindergarten child, but also to girls and boys through all the years of school life.

I can not too earnestly urge upon you the importance of providing a home study table and chair suited to the height of each child, and that a book-rest be also provided to prevent dropping the head and chest forward while studying. If you can not buy such a "rest" the child's father or older brother can make one that will answer the purpose. The light should

strike the book from the left side or over the shoulder, and it should be strong enough to prevent eye strain. The room in which children prepare their lessons should be cool and quiet, and they should not be allowed to interrupt one another during study. Much nervous energy is wasted through lack of care in these things.

I need not urge upon you the importance of long nights of undisturbed slumber during the school life of girls and boys. It is during those years that bones and muscles are lengthening, and internal organs enlarging, and the consequent strain upon the body is very great. Plenty of nutritious, easily digested food is needed to maintain the nutrition of the fast multiplying body cells, so do not be afraid to feed your children well.

It is not generally known that the after results of infectious diseases, measles,

mumps, whooping cough, etc., are likely to be especially harmful to girls and boys during the years between twelve and fifteen. If these diseases are contracted, great care should be taken to make the convalescence complete. Girls especially should not resume school work until sufficient time has elapsed for the pelvic organs to recover their nutrition and normal tone.

The storms of emotion so common in the young are harmful to both brain and body, and should therefore be averted whenever possible. If they can not be prevented, the boy or girl should be controlled firmly, and if necessary, forcefully, in order to relieve the nervous system of overstrain.

An unreserved intimacy between yourself and your children, both boys and girls, is ideal. It should begin in early childhood, and be guarded with zealous

care during adolescence, for at that time more than at any other it is needed, yet most likely to be lost. When questions are asked regarding the beginnings of life, it is important to answer them directly and truthfully, but only such parts of the story should be told as are adapted to the age and understanding of the questioner. Anticipate the teaching of the playmates of your boys and girls on sex subjects. Never permit them to hear for the first time the beautiful story of motherhood from any lips but your own. I would say the same regarding the teaching of spiritual truths. This also is one of the high privileges belonging to you that you should not yield to another.

I have not attempted in these letters to consider any subject exhaustively. Remembering my own girlhood, I have endeavored to tell some of the things which I now know would have been useful to me

could I have been told them. If, with your endorsement, my teaching shall prove helpful to the girls who so soon must take our places on life's stage, I shall consider my vacation hours well spent.

Most sincerely the friend of all mothers,

ELIZA M. MOSHER.

Letter One

NEWBURYPORT, MASSACHUSETTS

HEALTH AND HAPPINESS

Letter One

NEWBURYPORT, MASSACHUSETTS.

My Dear Girls:

For a long time I have been wishing to write some letters to you in which I could tell you things about the human body and the needs of girls. They are things that I now know would have been helpful to me if they had been told me when I was a girl.

With two friends I am planning to take an interesting trip this summer, and, because I can find no time for it otherwise, I have promised myself to write you a letter from each of our stopping places. I doubt if I shall be able to write about the places we visit, but my pleasure in seeing them may give an atmosphere to

my letters, which I hope will help to make them interesting. If I did not love young girls and wish very much to be of use to them, you may be sure I would not attempt to steal time during my summer vacation to write letters to you.

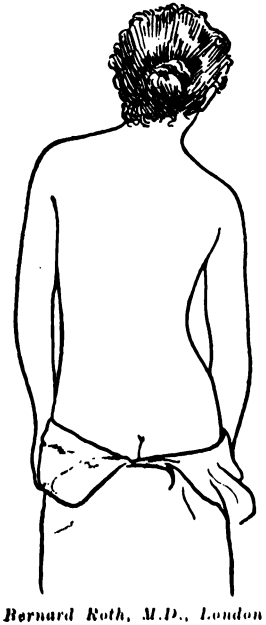
In the first letters I shall explain "Nature's Plan" for keeping the human body symmetrical, healthy and attractive, because that is one of the very first things you all need to know. I am sorry to say that mothers and teachers who are so wise in other respects, do not all know this "plan" or how simple is the teaching required to keep young people in good bodily shape. It is a more serious and far-reaching misfortune than is generally understood for a girl or boy to acquire round shoulders and a flat chest, with the forward poked head that always accompanies this shape; almost as bad in effect upon the body is the low shoulder,

high hip and head-on-one-side figure so common among school girls. Both shapes are due to bad habits of posture in standing and sitting, and the sad thing about it is that when such habits are once acquired they are likely to continue through life. In addition to their harmful influence upon the health, such shapes often become a hindrance to social and professional advancement later in life. "Has the applicant any personal peculiarities?" is on every list of questions sent out by teachers' agencies for the purpose of ascertaining the fitness of those applying for positions. This question indicates the desirability of finely shaped bodies in addition to well devel-

Courtesy of Bernard Roth, M.D., London.

FIG. 1

Round shoulders and flat chest from habit of dropping pelvis low at back in standing, sitting and walking.



Bernard Roth, M.D., London
FIG. 2
"Right Foot Twist" of Author

oped intellects for the profession of teaching.

I suppose you will scarcely believe me when I tell you that I worked several years to discover and formulate this "plan" of nature to keep the body shapely. It seems so simple and obvious when understood that one wonders why everybody has not always known it.

When I had found out the secret I wished to be sure that I was not mistaken, so I told it to a body of medical men and women, because you know doctors never believe anything unless you can prove its

truth to them. To my great satisfaction, they said that the "plan" was certainly Nature's own, and therefore correct, and its teaching very important. I next told it to a number of gymnasium teachers, men and women who were giving all their time to developing and strengthening the bodies of boys and girls. They also said this was indeed Nature's scheme for keeping the human body symmetrical and beautiful, so cheating old Father Time out of the bent spines and hobbling steps which in the past, yes, and present, too, he has been so fond of bestowing upon the aged.

I have explained the "plan" to hundreds of women in Mothers' Clubs and in other places, showing them school children by the dozen as round shouldered and crooked, as badly constructed seats and bad habits of posture could make them. In a few minutes under simple

instruction the children for the moment regained their lost symmetry and showed how easily correct habits of posture would make the change permanent. I gave those mothers the rules for standing, sitting and walking that I shall give you later, and it is to be hoped they taught them to their children.

I have derived the most satisfaction, however, from seeing over-sensitive boys and girls, and grown women, too, who were not physically strong, gain in health and physical strength as well as in good looks and self-assurance as the result of a short course of training.

I am inclined to believe that most fast-growing children are self-conscious and more or less physically unhappy between the ages of thirteen and fifteen. The unfavorable criticisms which they constantly hear regarding themselves and the unwise advice often given, make them grow more

crooked in body, morbid in mind and sensitive in soul. It had that effect upon me when I was young, and put me out of harmony with life in general and with myself in particular. It was the memory of those growing years which made me determine that I would find out why girls get round shouldered, awkward and sensitive, and help to prevent it as far as I could.

Do you understand now, girls, why I am writing to you, and how much I want you not only to read my letters, but to put into *immediate use* every direction I give you? When you have yourselves acquired right habits of posture and have made your own bodies straight and symmetrical, I want you to teach others to do the same—first by your example and then by giving them the instruction I am going to give you in these letters.

Letter Two

HAMPTON FALLS, NEW HAMPSHIRE

Letter Two

HAMPTON FALLS, NEW HAMPSHIRE.

My Dear Girls:

These old elm trees in New England are magnificent. I have been asking myself the question, why are they so much more beautiful than other trees? It is not because of the greenness of their leaves, for they are almost as beautiful when bare in winter. It is not because of their massiveness, for other trees are as large and sturdy as elms. I think it must be their fine proportion and symmetry. The exact balance of material in their great trunk-like branches produces a counterpoise which satisfies the eye of the beholder. When a limb has fallen, or close proximity to other trees causes un-

Courtesy of Ira Woodbury E. Kent Company, Concord, N. H.

THE [illegible]—PLEASANT SUMMERTIME IN TREES

equal growth, the elm loses its great beauty.

For the same reason the Church of the Madeleine, in Paris, delights all who see it; its height and breadth seem exactly proportionate; its pillars just the right size to support the massive roof, and there is not one too many nor one too few. Architecturally it holds the place among churches that the elm occupies among trees, and for the same reasons.

Beauty in animal forms depends far more on proportion and symmetry than upon handsome fur and hair, or even feathers. Compare the horse with the giraffe or camel, the former, with its fine proportions and grace of movement, the latter with parts so disproportionate that they look as if they had been taken from altogether different species and put together haphazard. The human body is beautiful or otherwise, according to the

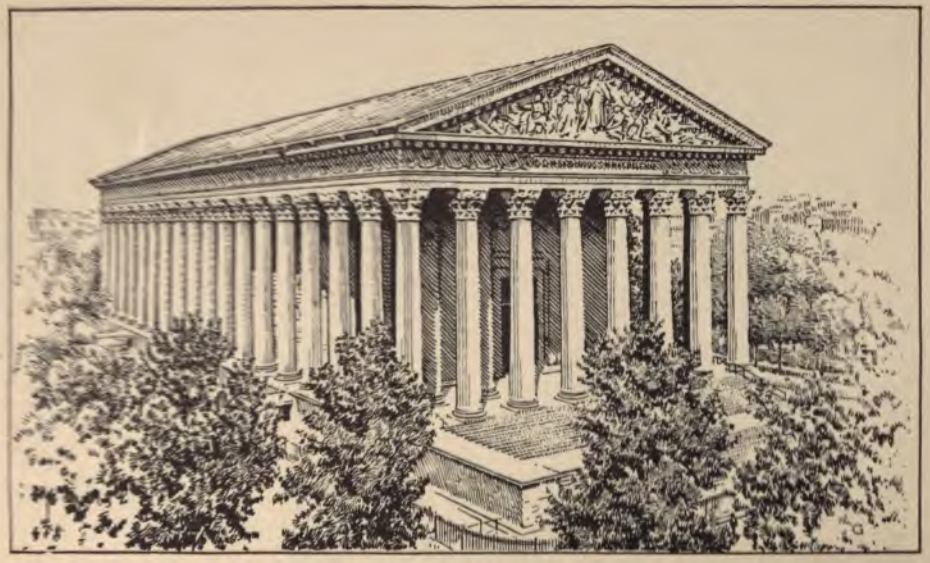


FIG. 4—EGLISE DE LA MADELEINE, PARIS
Perfect symmetry in architecture

proportion of its parts, its perfect poise and symmetry. The old Greeks realized this, and in the physical education of their young men great attention was given to building their bodies symmetrically.

Greek sculpture will forever remain the wonder and delight of mankind because it embodies such marvelous ideals of bodily perfection. Those old sculptors, we are told, began the study of the human body with its skeleton, and if I am to make you fully understand "Nature's Plan" for keeping the body symmetrical, I also shall have to begin with its fundamental parts.

The bony framework of an animal or man is not an attractive thing to look upon until we make a careful study of it in reference to design, and to the relation of its parts, at the same time remembering Who it was that planned the long series of evolutions which should end finally in a body so perfect that a soul

FIG. 5—ANTIQUE BAS RELIEF
Perfect Symmetry of Body

immortal and Godlike might find within it an earthly dwelling place. With these things in mind I am sure, girls, you will enjoy taking up with me a short study of the human body.

LETTER TWO

In examining a skeleton, the first thing which interests one is the number and variety of shapes of the bones that compose it. These are long and short, thick and irregular, thin and flat. If we carefully observe individual bones, we discover elevations, depressions, grooves and sockets, as carefully formed as are those in the stones prepared for building a great temple. In an upright structure like the human body we should expect to find a central section more or less firm, to which subordinate parts are fastened. Such a central section is presented in the spinal column and pelvis, fastened immovably together. The spine is made up of twenty-four curiously shaped bones that lock and interlock with sufficient looseness to permit a small degree of motion at each joint. It is broad below where it rests upon the upper and back border of the pelvis, and it tapers upward to its apex,

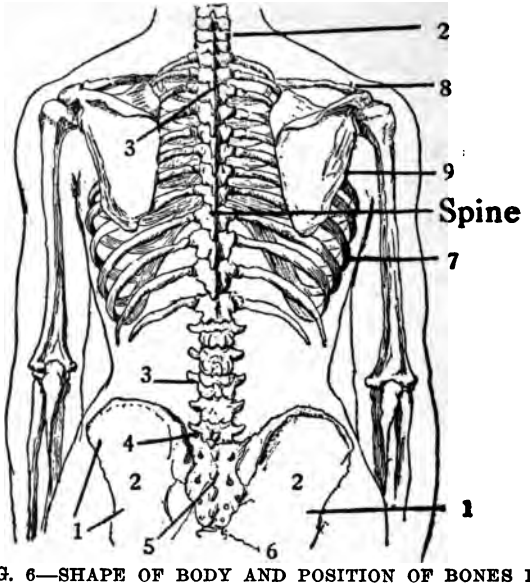


FIG. 6—SHAPE OF BODY AND POSITION OF BONES IN NORMAL POISE

1. Pelvis
2. Innominate bones
3. Spinal column
4. Attachment of spine to pelvis
5. Sacrum
6. Coccyx
7. Ribs
8. Collar bone
9. Shoulder blade

upon which is poised the head, much as a ball rests upon the top of a post.

Looking at a skull you could not guess how heavy it is. The separate bones of which it is made up are some of them

very hard; for their size they are the heaviest bones in the skeleton. I suppose this is necessary in order perfectly to protect the brain, which is the most delicate and important structure within the human body.

The ribs are twenty-four thin, narrow, curved bones, some long, some short, that fasten by hingelike joints to the spine in its middle third. These, with the breast bone, with which they are connected in front, the collar bones (clavicles) and the shoulder blades (scapulæ) make up the chest which you know encloses and protects the heart and lungs. You can readily see that the spinal column is pretty well loaded down with the skull on its top and the chest hanging forward and downward from its middle section, but these are not all the weights it has to carry. The arms, which in the adult weigh a pound or more each, are also

fastened to it through the shoulder blades with which they are connected. Each of the twenty-four vertebræ, which together make up the spine, has at its back a notch that is converted into a canal when the bones are in place, one above the other. At the base of the skull there is a large circular hole—the *foramen magnum,* through which this canal opens into the cavity of the skull; in this bony canal the spinal cord lies, carefully protected from harm. It is about as large as your little finger, and is made up of nerve-cells and their projecting fibers. These fibers, when they unite with prolongations from other nerve-cells, become nerves. Motor projection fibers from cells in the brain pass down the cord and out to muscles, while sensory fibers beginning in the skin convey messages up the cord to the brain. The spinal cord and the brain, with the nerves passing out

and in, make up the cerebro-spinal nervous system, which I shall describe later.

The pelvis, upon which the weighted spinal column rests, and to which it is immovably fastened, is made up in early life of four bones, the sacrum, coccyx and the two innominates—called "unnamed bones," because in shape they are so peculiar that they could not be compared to any known thing. These two innominate bones early unite so firmly with each other in front, and to the sacrum behind, that together they form one large, basin-shaped bone, and this is called the pelvis. From the upper border of the sacrum the spinal column rises as if it were a prolongation upward of the pelvis. The coccyx prolongs the sacrum downward, and in quadrupeds it has many additional segments which together form the tail. If you examine a pelvis you will find, low down on each side, two cup-shaped, socket-

like cavities, into which fit loosely, but most accurately, the ball-shaped heads of the thigh bones with which the leg bones are jointed. These are completed below by those many-jointed structures, the feet.

It would seem that a spinal column, flexible, heavily weighted and fastened immovably to such an unstable pedestal as the pelvis, might be sufficiently difficult to maintain in an upright position without raising it on such unsteady, stilt-like columns as the legs. This is the way our bodies are made, however, and it explains the difficulties which children encounter in learning to walk. It accounts also for the many tumbles which some of us tall people get when we attempt to walk upon slippery ground and when we fail to lift our feet high enough to step over obstacles in our path. The bony skeleton presents numerous projections and rough surfaces for the attachments

of the muscles, whose office is to move the body, and for fibrous tissue which strengthens its walls and binds its joints firmly together.

From spine, lower ribs and breast bone sheets of muscle spread out to form the abdominal chamber, in which are the stomach, intestines, liver, pancreas, spleen and kidneys. This chamber is separated from the chest above it by the diaphragm, a broad firm layer of fibrous tissue on which fan-shaped muscles are spread. In the cavity of the pelvis other important organs find a well-protected resting place, altho no diaphragm intervenes to preserve them from the encroachment of organs lying in the abdomen above. The spaces between bones, muscles and fibrous tissue are, in health, more or less filled with fat, which not only smooths out and pads uneven places, but serves as a storehouse of food

materials, which may be drawn from in time of need. Over skeleton, muscles, fibrous tissue and fat the skin is spread like a beautiful, flexible, waterproof case. It protects the delicate tissues beneath it; and provides a great surface from which sensory nerve-ends may catch messages from the outside world; it maintains the even heat of the body, and when whole, it shuts out disease-producing germs as completely as if it were an hermetically sealed case.

With this brief outline of the fundamental structures of the body, much of which you doubtless already know, I shall be able in my next letter to give you in detail the principles on which correct poise of body depends.

Letter Three

PORTSMOUTH, NEW HAMPSHIRE

Letter Three

PORTSMOUTH, NEW HAMPSHIRE.

My Dear Girls:

Have you ever stopt to think how gigantic must have been the task, even for an Omnipotent Creator, to transform a horizontally moving animal body, carried so easily on four legs, into a human body which must rest on two feet only, and whose every movement is opposed by the force of gravitation?

Muscles that in the quadruped were given little work had to grow strong for the performance of unwonted tasks, while hard-worked muscles, like those which in the animal supported the forward hanging head, had so little to do that they dwindled in size and strength. All the

beautiful, and to feel the joy of love and the hope of immortality. With all these gifts came to man responsibilities from which he can not lightly turn, among them the ability to understand his own bodily mechanism and to care for it intelligently.

While I have been writing to you about the body structure, I have not forgotten my promise, girls, to tell you how to avoid becoming round shouldered, and now that you have the scheme of the body in mind, I am sure you will easily understand my teaching.

You remember my statement that the spine is immovably fastened to the back of the pelvis, and, therefore, must move with it; that the chest, arms and shoulder blades are connected with the spine, which makes their position dependent upon the shape it assumes.

I told you also that the head rests upon

When we contrast the two structures, quadruped animal and biped human, taking into consideration the physical losses that the upright posture entailed, we understand better than we otherwise could man's physical limitations. It is well that with all these losses there was added to his brain groups of psychic cells comparatively few in number in lower forms—cells which enable him not only to comprehend his own structure, but also to modify his environment and suit it to his needs.

It is well that he can manufacture clothing, plow the ground, sow and garner grains; well that to him came a mind and soul, and the ability to harness the world's great forces to make them his servants. Surely, man could abundantly afford to step out of that clumsy, quadruped body, when to him was to be given the power to appreciate the good, the true, and the

position tends to fall over backward; *to prevent this, the head must move forward as ballast,* carrying the upper part of the spine with it. In the glass you will now see that you have round shoulders and a forward poked head. If you are not yet convinced of the truth of my statement, try another posture. Drop the pelvis on the left and elevate it on the right side. To do this you will only have to stand on the right foot and permit the other to slide diagonally forward and to the left. Stand in that position a few moments, and if you look in the glass you will see, not a round-shouldered girl, but one with head on one side, the right shoulder lower than the left, a high right hip (the left low), a short side line from armpit to belt on the right, and a longer one on on the left, like the boy in Fig. 9. Every dressmaker is familiar with this shape and learns to make the skirt of a gown

longer on the side having the high hip, and the waist shorter proportionately on the same side.

Now try one more position. Place the right foot a short step in advance of the

FIG. 8
"RIGHT FOOT TWIST"
Lazy left leg permits pelvis to drop on that side. Spine curves to move upper weight over supporting right foot and to balance the hanging left leg

FIG. 9
CORRECT POSTURE
Illustrating the "one-two-three-four posture rules" of author

left, with toes pointing directly forward; drop the pelvis a little (the position that makes your skirt long in front), elevate your head (stretch the neck a little upward, chin in), and sway the entire trunk gently forward until you feel your weight resting on the "ball" of the forward foot. If you look in the glass you will see a girl with head high, shoulders even, hips on a level and side lines of the same length, a posture well shown by the boy in Fig. 9. Your body is now symmetrically placed, and it became so by dropping the pelvis in front instead of at the back and making it level by placing both feet directly under it—altho one was a little in advance of the other, so that when the weight rested on one foot it was not necessary to drop the pelvis on the opposite side. When you stand in this position, every organ has the largest and best place possible for its work, and all

the muscles of the body are symmetrically placed.

We always hitch our bodies, so to speak, to the force of gravitation; that is, the spine is always adjusting its weights in a manner to balance each other, that the muscles may be relieved of work. This is economic of energy; before, however, we yield ourselves to gravic force it is important that we shall adjust our weights symmetrically.

I have more to say to you on this subject, but now I ask you to commit to memory this "Plan of Nature": THE POSITION IN WHICH THE PELVIS IS HELD DECIDES THE SHAPE OF THE BODY IN STANDING, SITTING AND WALKING.

Letter Four

YORK, MAINE

Letter Four

YORK, MAINE.

My Dear Girls:

I am wondering how many of you, since reading my last letter, have tried to find out what habit of posture you have acquired, for we are all "creatures of habit" in our ways of standing, sitting and walking, as well as in most other things. One summer several years ago, when I was writing a paper on the "Habitual Postures of School Children" I asked a dozen or twenty of my friends to give me a good definition of the word HABIT. From their answers I formulated the following: "Habit is the unconscious repetition of an act originally performed with some degree of volition." Altho you have for-

gotten it, you learned to stand and walk with great difficulty. You do it now, however, with little conscious effort. With what clumsy fingers the beginner strikes the keys of a piano! Frequent repetition soon enables him to play with ease and almost without thought.

Nearly every child under six years of age stands and walks correctly, and possesses a symmetrical body. He has never been still long enough in one position, nor has he repeated the same movements sufficiently to acquire other than a normal shape. About this age, however, his conditions of life change, and too often something in his environment causes him repeatedly to assume postures less normal than those to which he has been accustomed. It may be confinement to a school seat and desk unsuited to his size and shape, or standing long in class causes him to lounge and to lean. His shoes

being stiff may produce a blister or corn, or his stockings may be too short. Bad postural habits are generally formed under

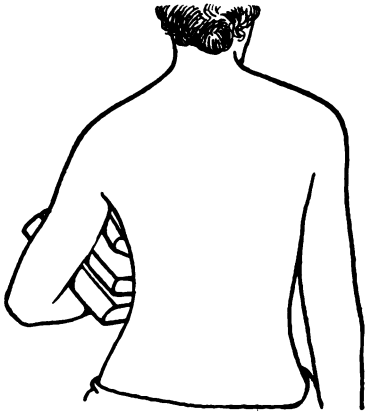


FIG. 10—CURVE WHICH SPINE ASSUMES IN CARRYING BOOKS UNDER ONE ARM

conditions more or less accidental and unnecessary, and at no period of life is the body exempt from acquiring them. Frequent repetition of a movement or a posture is the mold in which the new shape is formed.

Now, girls, may I make a guess in reference to the body shape that many of you have begun to acquire, and which will become permanent if you do not change your present habit of posture? It is only a guess, you know, so I do not mind if I am mistaken—indeed, I hope I am wrong. You have what I call a "right foot twist." Your head has inclined so habitually toward the right shoulder that the neck muscles on that side are shortened. Of this you can assure yourself by dropping the head forcibly toward the left shoulder. The muscles feel more tense on the right side of the neck, do they not, than on the left, when you let your head fall toward the opposite side? Your right shoulder is lower than the left, and the right hip is high and square at the top, as compared with its fellow. You can feel this by sliding your hands down over the hips. The muscles at the back of the right hip are

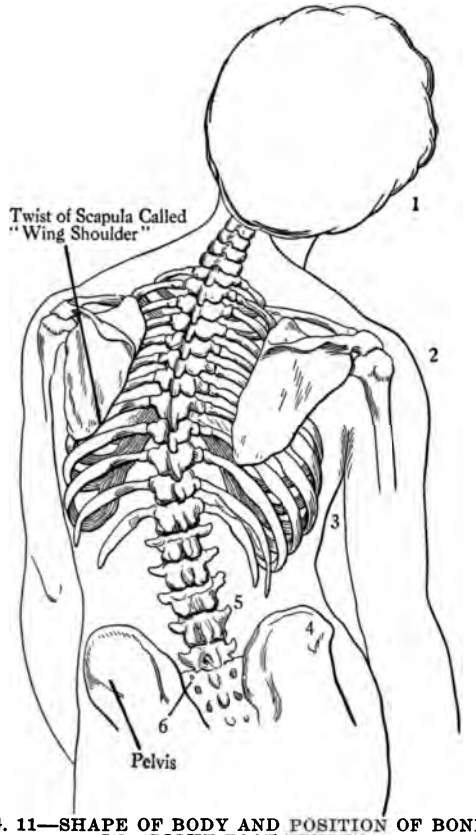


FIG. 11—SHAPE OF BODY AND POSITION OF BONES IN "RIGHT FOOT TWIST"

1. Head dropt toward right shoulder.
2. Short neck line—low shoulder.
3. Short side line.
4. High hip.
5. Deep gutter between ribs and hips.
6. Attachment of spine to bones of pelvis. "Right foot twist." Standing on right foot with the left directed diagonally forward.

larger than those on the other side; the gutter between the top of the hip and the lower ribs is deeper and the tissues are distinctly more soft in that hollow than on the opposite side.

If this shape has really become fixt by long habit, or because your tissues are delicate, many other losses in your body symmetry will have occurred, altho less evident. The flesh of the face is soft, and when the head drops on one side habitually, gravity takes a hand, so to speak, and changes the face lines. If, as I suspect, your habit is to incline your head toward the right shoulder, the right cheek will be fuller than the left, for the loose tissue falls away from the bone on the low side, while on the upper, it clings closely to it, thereby flattening the cheek. The lower lid drops with the cheek tissues, so the right eye in the course of time looks larger and more round, while the other

tends to grow smaller and to open less widely.

Nor is this all, the line from the outer angle of the nose to the corner of the mouth, smooths out more or less under the pull of cheek tissues. Its counterpart on the left side deepens because the tissues on that side fall toward the nose rather than away from it. Photographers always choose the side of the face which has been held toward the shoulder to photograph, "because it is the better looking side of the face," they say. And so, girls, if you have been unfortunate enough to carry your head tipped toward one shoulder, remember to turn that side of your face toward people when you wish to look your best.

All these changes in body symmetry have come as a result of your habit of standing on the right foot, with the left foot thrust diagonally forward and out-

ward. In this position the trunk had to move over to the right leg for support, while the lazy left leg hung like a weight upon the side of the pelvis. Of course, a counter balancing weight for that lazy leg was needed, so you dropt your head to the right and lowered the right shoulder and arm. When I was making a study of this subject and wished to prove my theory, namely, that it is to balance the weight of the unused leg that the head and arm move over to the right, I looked for a man with but one leg. One day on the street, I saw an unfortunate fellow, who had lost his entire left leg clumping along on his crutches. My need was so great, that I mustered courage to ask if he would be willing to help me with some work I was doing. I judged, and rightly, that he needed money, and I, therefore, could help him also. At my office he laid aside his crutches, and

stood on his leg with pelvis almost perfectly horizontal, and without dropping his head to the right shoulder or lowering his right arm. He did not need to do so, because he had no leg hanging idly from the pelvis, needing to be balanced by weights above. So you see, girls, if you wish to regain your symmetry of body you can not continue your habit of standing with one foot placed diagonally forward, thus tilting your pelvis down on that side and up on the other. I have guessed that the left will be the lazy leg because most of you are right handed, and it is, therefore, easier to turn the body to the right. Some of you have a "left foot twist," in which case the shape that I have described will be reversed. Some of you, too, have defective eyes. From these, or some accidental condition, you may have fallen into the habit of dropping the head to

the left, even tho you have a "right foot twist."

I hope some one will wish to ask the question, "How can I get rid of the bad shape I have acquired?" Simply by never again standing or sitting in the position which produced it. Follow the rule I shall give you at the end of this letter, and in a few weeks all your body lines will again become what they were when you were six years old. You may have to give your neck frequent stretchings and twistings to lengthen its short muscles, and you must carry your head very high, remembering my illustration of the trolley wheel. You need to do this to keep the upper part of the spine straight and the neck from bending forward. The new habit may not be easy to form, but here is where intellect will come to the front and enable us to remove physical handicaps.

Some of you girls, whom I see in imagi-

nation, have round shoulders and hollow chests. It is very unfortunate, for this shape injures the internal organs much more seriously than does a "right" or "left foot twist." I described this shape fully in my last letter, giving the causes which produce it, namely habitually dropping the pelvis at the back and elevating it in front. I only need say, "Never try to 'throw the shoulders back,' but instead, unfold the body upward; follow my rule for standing, and especially for sitting; use a low pillow—never a high one, and you will regain your lost symmetry if you are persevering."

Here are my rules for correct standing —"one, two, three and four":

RULES FOR STANDING CORRECTLY

1. With knees near together place the feet in position for walking, the right foot a step in advance, toes pointing straight forward.

2. Drop the pelvis a little at the front.

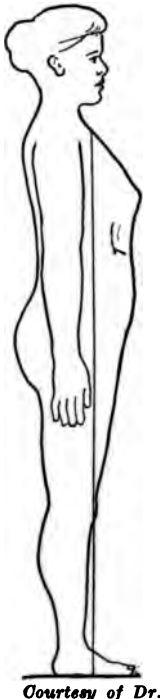
3. Lift the head high (chin well in).

4. Sway the entire body gently forward until its weight is felt to rest on the ball of the forward foot. Find an easy balance in this position.

It may help you to imagine you have a little wheel on the top of your head at its middle, and above it a wire like the one the overhead trolley wheel runs on. Hold your head in a position which would keep the wheel on the wire, in standing, walking and sitting—not stiffly, of course, but easily pushed upward.

In walking, the toes should point forward—not outward, as we were taught when I was young. To turn them out locks the ankle and makes it difficult to bend the knee and to raise the heel as high as we must to acquire an elastic step. Each leg should do its share of pushing

the body forward. Many people in walking form the habit of using but one leg forcefully, while the other is practically swung forward with the pelvis. Of course, that foot takes its turn upon the ground and supports the body, but it does as little work as possible. Especially is this true when the spine is curved unnaturally. In walking, the chest and head should lead the rest of the body, as it does when we *hurry forward.* Be sure to carry your head high. Imagine yourself a princess or some other person of dignity, better still, hold it high because you respect yourself.



Courtesy of Dr. J. H. Kellogg.
FIG. 12
"HEAD HIGH"

In sitting observe the same rule as regards the position of the head,

and do not slide down on the chair as the boy does in Fig. 14. Catch a balance with trunk erect. If your chair or seat does not suit your shape sufficiently to help you, ignore its bad back and depend wholly upon your own.*

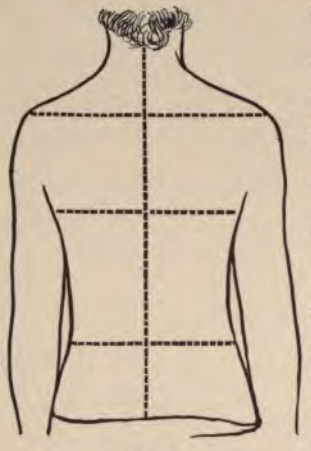


FIG. 13
A Perfectly Symmetrical Back, Body in Normal Poise

Be careful to maintain good bodily postures during sleep. The spine should be moderately straight and the legs stretched downward, not bent so the knees approach

* The kindergarten chair designed by me several years ago, and in use in the public schools of New York City, demonstrates the fact that a narrow bar across the back of a chair behind the shoulders is all that is needed to make it comfortable, *provided there is space for the pelvis to slide under it.* The seat can not be wide from before backward, however, or it will strike the child's legs behind the knees.

the chest. It is better, doubtless, to lie a little off the back than directly on it, but no one position should be permitted to become habitual. A low pillow is better for the body than either a high one or none. The bed should always be away from a wall, and reasonably near a window. It should not be in an alcove, nor in a corner, for if outdoor air does not come in direct contact with the nose, it loses some of its value as fresh air, and the carbon dioxide thrown off by the lungs will not be carried far enough away, to avoid being breathed again.

The ideal thing, of course, is to sleep in the open air, and I hope the time will soon come when out-of-door bedrooms will be thought a necessity. It is much more invigorating to children and young people, to sleep in separate rooms, for even to a good sleeper the presence of another person in the room is likely to be disturbing.

FIG. 14
One of the postures that produces round shoulders and flat chest

FIG. 15
Round shoulders in the making

FIG. 16
Bad Sitting Posture

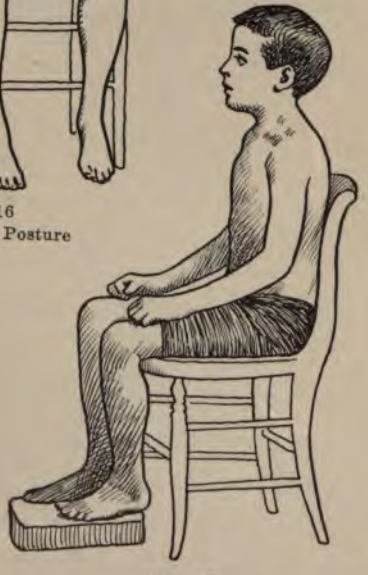


FIG. 17
Correct Sitting Posture

FIG. 18
Mosher Kindergarten Chair

To the large number of girls among you who are strong and symmetrical, let me say: keep yourselves so! Do not treat your bodies carelessly because they never cry out with pain. Thank God and your parents for them every day you live, and realize your responsibility to pass on to the next generation something just as fine.

Letter Five

PORTLAND, MAINE

Letter Five

PORTLAND, MAINE.

My Dear Girls:

Before I can tell you other things you wish to know about the human body, I must explain the way in which it is nourished, because every part must be kept strong if we are to do our work in the world.

If you have studied biology, as I hope you have, you have learned that all living organisms are made up of microscopic particles called cells, which are united by intercellular material of different kinds; these cells are surrounded by moisture in which are dissolved the nutrient substances taken into the body as food.

If you examine the pulp of an orange, you will see that it consists of little sacs

laid beautifully side by side, and that each sac contains what seems to be sweet water. These very well represent the cells of the human body, tho they do not hold in solution all the constituents that the body

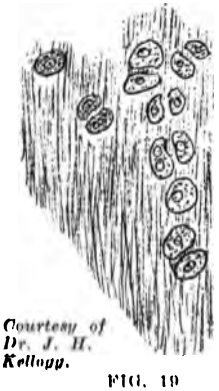


FIG. 19
Cartilage Tissue Cells

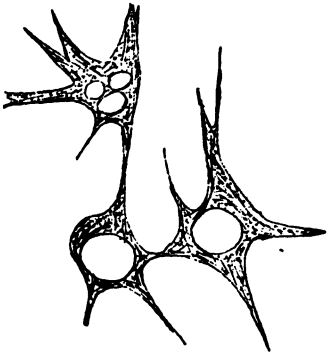


FIG. 20
Fat Cells

needs. Our body-cells contain oxygen, water, protein, carbohydrate, fat, mineral salts, and sometimes other substances, which are constantly undergoing chemical changes that result in both loss and gain to the cells. They exude their waste into the moisture which surrounds them

and withdraw from it such chemical substances as they require to replace loss and reproduce cells like themselves. This they must do if the body is to grow.

You ask me how the materials from the

FIG. 21
(a) Epithelial Cells
(b) Fibrous Tissue Cells

FIG. 22
Cells

food we eat get into this moisture around the cells, and how the moisture gets rid of the waste thrown into it from them. When I have answered these questions you will be more sure than ever that our bodies are part of the plan of a great Creator; not the result of chance, as some say.

The liquid around the cells is the water

of the blood, and we call it plasma or lymph. It passes out of the blood current through microscopic openings in the walls of the capillary blood-vessels, which are

FIG. 23
Epithelial Cells

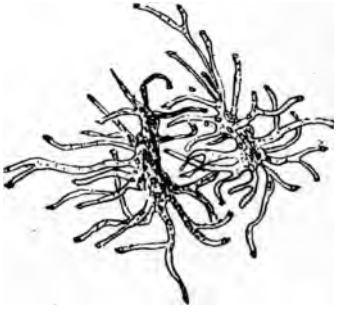


FIG. 24
Elastic Tissue (highly magnified)

themselves so tiny we can not see them with the naked eye.

Every beat of the heart sends a current of blood through the large vessels into the capillaries. If the beats are slow and weak their walls are not distended, and very little lymph exudes; but if the heart beats fast and hard, the capillaries fill so full that the lymph leaks out into the

tissues, to replenish the food supply of the cells. This is why running, walking and gymnastic exercises which set the heart beating fast and hard, improve the

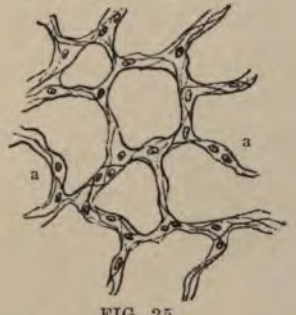


FIG. 25
Capillary Blood-vessel
(a) Red Blood-cells

FIG. 26
Capillary Blood-vessel
in Relation to Cells

nutrition of the body as they do, while a sedentary life weakens it.

You say to me, "Suppose I should push out too much lymph by running a long time?" To arrange for that, a system of lymph-tubes begins, whose open mouths lie in the moisture around cells. These tubes suck up the surplus lymph as fast as it flows out, and carry it by a network

of canals back to the main blood current, in which it starts on its rounds again. You see it would not do to let so much good lymph be lost from the blood; it would weaken that important fluid besides being uneconomic. The waste from the cells is thrown into the lymph, as I have said, and also goes into the blood, to be removed from the body by the lungs, kidneys, and skin, as it flows through those organs.

When you eat a hearty meal containing meat (protein), sugar, starch (carbohydrate), fat and salts, you are sending into the myriads of capillary blood-vessels surrounding your stomach and intestines, new nutrient material. The body-cells will not get any of it, however, from those capillary blood-vessels. The supply of protein you have taken in, or more likely starch and sugar, may have been too large to safely come in contact with some

of the delicate cells of the body; a part of it must be held back, and some perhaps thrown away.

All the vessels which receive the blood

FIG. 27
A liver lobule, showing cells and blood-vessels.

from the capillaries in the walls of the stomach and intestines go directly to the liver, where millions of cells act upon that which the blood brings, detain the surplus food, prepare waste to be removed by the kidneys and other organs, and send on only what is needed by the body-cells. Cell nutrition is not certain to be maintained,

however, even tho the supply of nutriment in the moisture by which they are surrounded is adequate. The *cells must be in condition to take it in.* In other words, the chemical changes which produce a demand for new material must be active, and the removal of waste complete if they are to be hungry for food.

Most of the water you drink passes into the blood stream to dilute and hasten the removal of waste from the cells. Lungs, kidneys and skin are waiting to carry this waste out of the body. You can readily see that if you drink but little water, those poisonous materials must make the circuit of the body again and again in the blood, growing more concentrated as its water is removed and not replaced. Do not wait for thirst to tell you it is time to drink, but knowing that your bodies need from one to two quarts of water a day outside the liquid taken at meals,

drink regularly that amount. If you take it at stated intervals for a few days, you will find yourself just as ready for it, as you are for your meals when the time for them arrives. Probably the best hours for drinking water are upon rising, retiring, and in the middle of the morning and afternoon, but take it when you can get it rather than omit it.

The stomach has such a difficult and delicate task to perform in conducting the chemical changes necessary to prepare food for absorption, that every other activity of the body should cease, for at least a half hour after eating. If the meal has been a heavy one, an hour is not too much to set apart conscientiously, for stomach digestion. To eat and hurry off to school or work, is an affront to the organs that are so patiently elaborating the materials on which we are dependent for ability to perform either physical or mental

tasks. It is like "killing the goose which laid the golden egg" to disturb the digestive process during its highest activity.

With the constituents of the body-cells in mind, it is easy to know what foods we should eat. Meat, eggs, milk, cheese, cereals and legumes (beans and pease), give to the cells the protein they require; starchy foods, cane and other sugars, fruits and vegetables, furnish carbohydrate; fat meat, cheese, cream, butter, eggs and nuts provide them with fat. Nearly all substances used as food contain mineral salts which replace those the cells are constantly losing in large amount.

The amount of each of these constituents needed by the body, depends upon the degree of concentration in which they exist in the substances eaten. Water and protein, make up the greater part of body-cells, and that is the reason why a person dies in a short time when deprived of

either. Too much protein, however, clogs the body and makes its work difficult; a large supply of sugar crowds the liver, and dulls the activities of the entire body. It is the same with a superabundance of fat.

From these facts you see, girls, that the process of maintaining the nutrition of the body is not a simple matter. The care that the Creator has given to perfecting the digestive organs and adapting them to the needs of man, demands on our part an intelligent and conscientious choice of food and drink; a rational control of the quantity taken, and an avoidance of physical and mental exertion just before eating and during the early part of digestion. Healthy body-cells, pure blood, a proper supply of nutriment, and plenty of physical exercise alternated with periods of rest, are what we all need to make us strong and vigorous in body and mind.

Letter Six

ST. JOHN, NEW BRUNSWICK

Letter Six

St. John, New Brunswick.

Dear Girls:

The processes by which waste substances are removed from the body are so important and so interesting that I think I must tell you about them before going on to other matters.

Nearly all foods contain carbon, altho sugar, starch and fat hold it in largest amount. This element, carbon, has a very useful way of separating somewhat easily from the combinations in which it enters the body, and uniting with other chemical elements near by for which it possesses a greater affinity. In this way carbon continually forms new combinations. In both separating and recombining, energy is set

free. This is manifested in the form of heat, which serves to keep the body warm, and in muscular movement. When carbon unites with oxygen in the proportion of one to two, carbon dioxide is formed, which not only is of no further use to the body, but is injurious to it, if any great amount accumulates in the tissues or in the blood.

Not alone from food is carbon dioxide formed in the body, but also through the breaking down of body-cells, most of which, as has been said in a former letter, contain carbohydrate and fat. From these two sources the body tissues are being loaded both day and night with the gas, carbon dioxide. From the tissues it passes into both blood and lymph capillaries through which it reaches the general blood current. Because of the importance of its prompt removal from the body, several outlets for it are provided.

Some passes by way of the skin, some with waste from the intestines and kidneys, but its great portal of exit is the lungs, which have the double duty to perform of supplying the body with oxygen, and carrying out its carbon dioxide.

You already know that those wonderful organs, the lungs, are made up of millions of microscopic air-sacs, and of bronchial tubes that connect them through the wind pipe, with the outside atmosphere. By the movement of the diaphragm and muscles of the chest walls, air is sucked in and forced out of the tubes in the lungs on an average of eighteen times a minute from birth till death.

From the air-tubes the air-sacs fill—at least as many of them as the chest walls make room for. When your clothing is so tight that it limits the movement of the chest, or if you flatten the chest by assuming the postures that produce round shoul-

ders, the space for air is encroached upon, and the number of air-cells which might fill is much reduced.

On the outside of all these air-sacs, which you must remember are so small

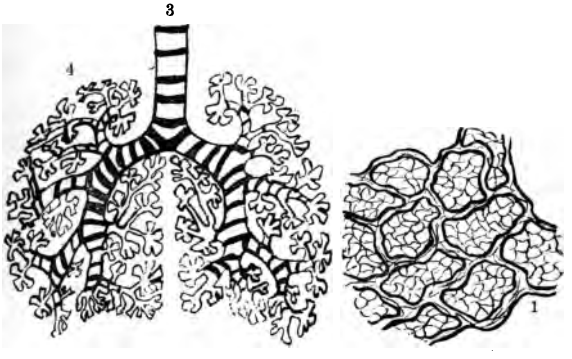


FIG. 28 FIG. 29

1—Lung tissue (highly magnified), with air-sacs surrounded by blood capillaries.
2—Bronchial tubes.
3—Wind pipe.
4—Air cells (balloons).

that you could not possibly see them without a microscope, is spread a network of capillary blood-vessels whose walls, as well as those of the air-cells, are so thin that gases easily pass through them.

The blood brought to the lungs has, in its journey through the body been giving off all the oxygen it could possibly spare to the needy body-cells along its route. When, therefore, it reaches those nice little lung-balloons filled with fresh air from out-of-doors, it quickly loads every bit of oxygen it can carry into its red cell-boats. While this work of reoxygenation is going on, the liquid portion of the blood, transfers its carbon dioxide to the air within the sacs, and from them it passes out through the windpipe. Thus relieved and replenished, the blood moves comfortably back to the heart, from which it is quickly forced with its oxygen-laden red cells, toward far away parts of the body. This process of intake of oxygen and removal of carbon dioxide, goes on constantly from birth until death, and both health and vigor of body, depend upon the perfection with which it is accomplished.

The removal of waste protein is a much more difficult problem than that of the removal of waste carbohydrate and fat. Protein contains an element, nitrogen, which, unlike carbon, separates with difficulty from its combinations, and, when separated it does not form a gas that can easily be carried out of the body. It has to pass through changes that may be compared to successive links of a chain, all of which must be perfect if the chain is to be complete. Suffice it to say that the last link of this protein chain is forged in the liver, where urea is formed. As urea it is delivered to the general blood current, in which it moves continually through the body. With each beat of the heart, a portion of blood loaded with urea enters the kidneys through arteries, large in proportion to the size of the organs to which they pass. As in the lungs, the carbon dioxide escapes from the blood stream,

so here in the kidney tubules, the urea finds its outlet.

The structure of the kidneys is quite as wonderful as that of the lungs, and much more difficult to describe, because

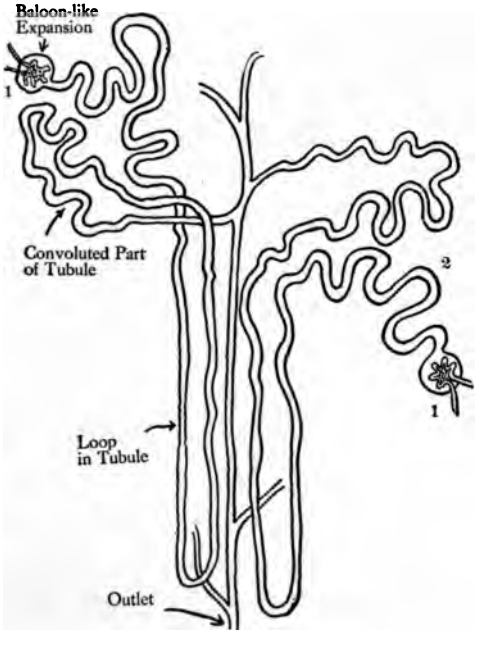


FIG. 30

1—Glomerulus of kidney tube.
2—Convoluted tube.

urea can not be removed by means of air, but demands a stream of water in which it may dissolve as fast as separated.

Microscopic tubes lined with epithelial cells with the blood-vessels make up the main structure of the kidneys. A flush of water is obtained at the beginning of each kidney tubule in a very curious way. In a balloon-like expansion of the tubule, a long, fine coil of capillary blood-vessels is placed, that provides the necessary amount of blood from which the cells lining the expansion abstract water. The office of this water is to wash down from the walls of the tubule farther on the urea and other waste substances which are there separated.

The small size of the kidneys makes it necessary for the urinary tubules to convolute and turn sharply upon themselves, in order to furnish sufficient tube lining to accomplish the work to be done. Blood

capillaries form networks around the tubules, and even those from which water was withdrawn in the expansion at the beginning of each tube, a second time supply blood from which urea may be separated.

FIG. 31—HUMAN KIDNEY, CUT OPEN LENGTHWISE

The tubules finally empty into the funnel-shaped, upper ends of the ureters, or outlet tubes, of which there is one for each kidney. From these the water flows, loaded with urea and many other waste substances to the urinary bladder, located low down in the pelvis in front. Here the kidney secretion is stored until the bladder becomes full, when it is discharged. The amount of solids thus eliminated each day by urine, depends upon the amount of protein taken, the amount

of water we drink, and the health of the kidney cells.

Mineral salts, of which a small amount is found in all body-cells, and a very large amount in bones, are taken into the body with food of nearly every kind. Because blood and lymph contain mineral salts in abundance, it is evident these are of great importance to the body. The surplus leaves it by way of its various excretions, but the largest amount passes in the urine. Table salt—chloride of sodium—is the only mineral salt we add to our food. The body seems to need it in larger amount than other salts, and certainly it plays an important rôle in the processes of nutrition. It is possible, however, to use too much with our meals, and in some conditions of the body no salt should be eaten.

Vegetables contain quite a large variety of salts, but unfortunately we waste most

of them by our uneconomic custom in this country of throwing away the water in which they are boiled. Little children need a much larger amount of mineral salts, than the foods upon which they are usually fed contain. This lack should be made up by giving them vegetable "purées," made by stirring the water, or part of it in which the vegetables were cooked, into the mashed and strained vegetable pulp.

The largest outlet for waste is the intestinal canal through which passes daily a large quantity of indigestible material that was taken in with foods, as well as the waste from body-cells. The last section of the canal, the colon, may be termed the general sewer of the body, for when any of the other outlets fail in their work, almost any kind of tissue waste can be made to pass by this route.

The digestive canal, you know, is about thirty feet long and its great office is to

absorb food substances. The last five or six feet, however, have for their work the preparation for and the removal of waste. The colon, or large intestine begins in the shelter of the right hip, rises upward to the under surface of the liver, bends abruptly, crosses the abdomen below the stomach, again turns and passes downward. Inside the left hip, upon the smooth, broad surface of the iliac bone, it again changes direction, assuming now somewhat the shape of the letter "S," not only that it may better adapt itself to the surface on which it lies, but to make a more perfect reservoir for the detention

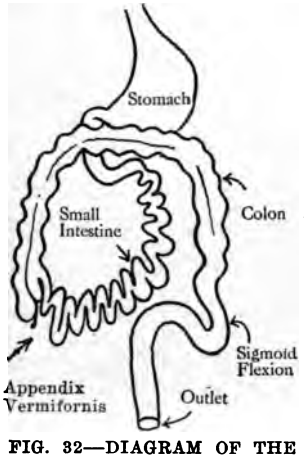


FIG. 32—DIAGRAM OF THE DIGESTIVE ORGANS

of the waste that has been prepared in the colon for removal from the body.

Continuous with this section is the rectum, which lies directly against the sacrum. It is about six inches long, and is intended as a quick passageway outward for intestinal waste. Its normal capacity is equal to that of the sigmoid flexure above it. Because of the close relation between the rectum and the organs that lie next it, waste substances should not be permitted habitually to collect in it and remain any length of time.

In the small intestine, food substances necessarily exist in a more or less liquid state for purposes of absorption. Usually they enter the colon in this liquid condition, but as they move through the canal much of the water is absorbed. The mass is gradually condensed by means of the muscular pressure exerted by the walls of the colon, so that on reaching the

sigmoid it is semi-solid and passes out of the body through the rectum, needing little help from the abdominal muscles.

Intestinal waste may become hard from too long a stay in the colon, or through insufficient secretion of intestinal mucous. It frequently becomes packed into dry, ball-like masses, which move slowly from sigmoid to rectum, and are expelled from the latter only with great effort. This condition is termed constipation, and its influence on the health of the body is always unfavorable.

When waste is detained in the colon, bacteria, always present there, multiply rapidly, and by their action on protein, produce harmful chemical changes. Absorption of new substances formed under their influence causes a variety of abnormal conditions, such as a general sense of fatigue or lassitude, headache, a weakened heart action, and sometimes severe

palpitation of the heart. It is as if one had manufactured his own medicine (in the intestinal canal), and taken it without prescription from a physician, and, as is often the case when people who are ignorant regarding the body try to dose themselves, "the last condition is worse than the first."

Constipation is produced in many ways: drinking too small an amount of water to keep the supply of liquid within the body plentiful and pure; insufficient physical exercise to promote needed body changes; too much or too little food; eating freely of meats and sparingly of vegetables; the free use of chocolate, crackers, toasted bread, and other foods which are known to retard the outward movement of waste; irregularity in the hours of meals and eating between meals; most serious of all, carelessness in responding to the call of the rectum for evacuation. The body is an

orderly machine and needs to have its methods of work understood and the life of the individual conducted accordingly, for, while it endures a great deal of hard usage, sooner or later it will succumb to it and ill-health result.

Now you understand, girls, some of my objections to the corset and to bad habits of posture. Both shut down the chest walls, lessen the space within it, and diminish the muscular movements that hasten the exchange of gases between blood and air. I trust that you also understand why I urge the drinking of water between meals. You know that the end product of protein in the body is urea, which is a poison, and that it must be carried out by water, and how those wonderful little organs, the kidneys, do it.

Remember, also, that we are constantly losing water, by our breath, in the form of vapor, by the intestines, and by the

skin, all of which must be replaced to keep the body fluids pure. Physical exercise not only improves body nutrition by crowding lymph out of capillary vessels to cells, but it hastens the movement of waste toward the outlets of the body.

We all need, just as early in life as possible, to acquire habits that tend to maintain health, for they will hold us to correct living, when in our busy lives, we might otherwise forget our duty.

Letter Seven

DIGBY, NOVA SCOTIA

Letter Seven

DIGBY, NOVA SCOTIA.

Dear Girls:

To possess a fine skin is the natural and proper ambition of every girl, for, when we stop to think of it, we realize that the skin is the only part of the body really seen by others, and we all desire to appear well before our fellows.

The skin is a "telltale," not only of what is going on in the cells within the body, but also of the thoughts that fill the mind. The blush of modesty and self-consciousness and the pallor of fright or pain are as easily interpreted as the sallowness due to retained excretions and the blueness of body chill.

I wonder if you girls know how many

kinds of work the skin performs. We generally think of it as a covering to protect the deeper parts of the body from injury, but that is only one of its functions. It offers the very best kind of a surface, for the nervous system to spread out its sheet of sensory nerves upon; it even provides elevations called papillæ, on which their terminal ends are raised, much as electric lights are elevated upon poles in our streets. With so many chemical changes going on within it that generate heat, the body is almost constantly in danger of becoming too warm. The skin, however, carefully prevents this, even on the hottest days of summer; for, when the body temperature begins to run up, the tiny sweat tubes that lie coiled up in its deeper layers at once begin to withdraw water from the blood in the capillary vessels by which they are surrounded. This water drips out of the sweat tubes upon

the surface of the skin, and by its evaporation body temperature is lowered. The skin is kept moist not only by the imperceptible prespiration that bathes it continually, but also by oil that oozes from glands lying in its deeper layers expressly adapted to the manufacture of it. Just enough oil is given out in health to keep the skin soft and make the hairs glossy that push their way through it.

FIG. 33—A TRANSVERSE SECTION OF SKIN

I have told you about all these functions so vital to health, because I wish to convince you of the great importance of giving to the skin of the entire body the good care which it needs and deserves.

In the palmy days of ancient Rome, its young men must have spent a large portion of their time at the baths, the re-

mains of which are most interesting. Even in Pompeii, buried so many hundred years ago, one sees the floor and finely decorated side walls of a public bath-house for men and women. In it the water was warmed by heating the air in open spaces below the floor, and around the bath tanks.

When we remember that almost every home to-day has its bathroom with hot and cold water on tap, we wonder that the habit of daily cleansing the skin of the entire body has not become universal. You have heard of the country woman who, seeing a handsomely tiled bathroom next her room in a New York hotel, said to her husband, "Isn't it a pity that this isn't Saturday night?"

"What kind of a daily bath should one take," do you ask? The kind which makes you feel most comfortable and vigorous! Many people thrive on a cold plunge on rising, followed by brisk rub-

bing with a rough towel. This is a form of bath I would hesitate to recommend to girls I have never seen. Some people enjoy a very hot bath at bed time and sleep well after it; others are kept awake by it and are made more sensitive to draughts and changes of temperature.

The morning bath best suited to persons of all ages, is probably a quick, hard scrub of the body in sections, first with very hot and then with cold water, drying each part before wetting the next. The entire body should be uncovered meanwhile, and the rubbing done with enough vigor to produce the glow of warmth, even in a cold room. Such a bath strengthens the skin, improves the circulation of blood, and invigorates the body in general. A bathroom is not required, and very little water can be made to answer the purpose. A quart each of hot and cold is sufficient if two cloths are used and the water is

poured over them. A tepid bath is liable to leave a person chilly and debilitated. I do not recommend it.

After gymnasium work the "needle bath" hot, followed by a dash of cold water, is excellent, and there is the never-to-be-omitted weekly or bi-weekly soaking bath in very warm water, followed by the use of soap *at the moment of leaving the tub* (not before), and a rinse-off with cold water. Now and then a girl feels tired and weak after taking any kind of bath, and there are always a few days in each month when the strongest girl should omit the regular bath. To such I recommend an all-over rub with a hot, moist towel (wet an end and wring into the remainder), followed by a dry one. You may observe that I have not suggested the use of a "sponge"; it is because it is so difficult to keep sponges clean that they are undesirable.

Soap may only be used daily on the hands, neck and feet. When applied very freely it removes too much of the oil secreted by the skin. Never use highly-scented, cheap soaps! They are too often made of waste grease, the smell of which would be offensive if it were not covered by the perfume (?). Castile soap is generally pure, as are the best soaps of any of our reliable American firms.

I know of nothing that has greater power than a bad complexion to make a proud sensitive girl or woman morbid and unhappy. I am glad that I had such an experience for a short time when I was young, for I understand, as I could not otherwise, how it makes a girl feel, and what a joy it is to recover from the condition. That which I have written you about the nutrition of body cells and the removal of waste, the frequent drinking of water, exercise and rest, are of the

greatest importance in the production and maintenance of a fine complexion.

The skin of the face is subjected to many irritants to which covered parts of the body are not exposed. The wind dries it, the dust scratches it like sand, and the tiny vegetable germs it blows about, get into the mouths of the oil-sacs, which not only stop them up, but find in them a warm protected place in which to grow and multiply. As they do this, the sac distends until it rises from the surface of the skin in which it lies, and becomes white or yellow, according to the variety of pus germ that found entrance. This is called a "fester." If you squeeze it, a drop of pus bursts forth.

If you are in good bodily condition, and the skin is well cared for, the gland openings will be small, and if you do not rub germs in from your hand, glove or veil, they will not gain entrance. If, however,

your skin is relaxed and its cells poorly nourished, (you know that it is made up of millions upon millions of epithelial cells), the mouths of both its perspiratory and oil glands will lie half open, ready to entrap any germ that comes its way.

FIG. 34
Gland in the skin of face, its orifice filled with dirt, making the so-called "black heads"

Do not touch your face, except to wash it, or with a perfectly clean handkerchief. Bathe the face two or three times a day, first with hot and then with cold water; use soap on it only when you have been in much dust. A little weak carbolic water is a good unirritating disinfectant to use at bedtime. It is wise to consult a specialist when pimples first appear; give attention to it early, just as you should to

every ailment of the body. It is much easier to correct a fault of any kind before it becomes a habit than afterward.

Now and then a girl is afflicted by hairs growing on the face, and for some reason it seems to me the number of women so annoyed is becoming larger as the years go by. I am sorry to say that at present we know of but one way to get rid of them safely and certainly and that is by the electric needle. Have the little root follicles destroyed, only be sure that a *very fine* electric needle is employed, and in the hands of one skilled in its use.

Never experiment with the much vaunted lotions and salves on the market, "for the removal of superfluous hairs." While the hair down *to* the root may be destroyed by them, it will grow again very soon larger and coarser than before. Avoid the use of fatty ointments on the face and the friction of a veil. When hairs are

present, use only tepid water, and avoid the use of soap as much as possible, also rough wash cloths and towels.

Above all things, do not stimulate the growth of hairs by unhappy thoughts about them. I mean to tell you later, when I write about the nervous system, how the *kind* of thinking we do affects the body for good and ill. The skin of the face is peculiarly influenced by thoughts and emotions, as you may know by the rapidity with which its color changes under their influence.

The scalp should be shampooed and the hair washed, about once a month to remove the dust that settles on and among the hairs. To do it oftener removes too much of the oil with which the little glands in the scalp strive to keep the hair soft and glossy. Soap should be rinsed off with great care each time, and when dry a little white vaseline or some very

pure oil may be carefully applied to the scalp with the tips of clean fingers. Friction of the scalp stimulates the growth of hair, but the surface skin should not be broken by it. Be particular to use a brush with rather soft long bristles or with a rubber back in which the bristles are set, and, above all things, wash the brush often—every three days at least, in a solution of borax or bicarbonate of soda.

The finger nails are appendages of the skin, and as such need constant care. They should be carefully trimmed once or twice a week, or filed a little daily. The rim around the nail should, as far as possible, be kept unbroken to prevent "hang nails," and do not cut it away unless it becomes broken. After the hands are thoroughly cleansed and soaked in warm, soapy water this rim around the nail may be carefully raised with a

small orange-wood or ivory scraper which has just been sterilized by boiling. Remember there is a deep groove at the root of the nail in which bacteria may find soil for development if the outer layer of the skin lining is torn or cut. The so-called "run-around," which is so painful, is caused by pus germs that multiply deep down in this gutter. A stab with the bristles of a dirty nail-brush is quite sufficient to infect the part and inaugurate that painful affection. Clean finger nails as well as well-kept hair, mark the lady and gentleman, while the opposite always makes us suspicious of other unclean habits.

Proper care of the teeth is even more important than that of the nails and hair, for the mouth is the vestibule of the body and whatever passes through it carries to the stomach such impurities and poisons as may have accumulated around the teeth.

It is, too, by its moisture, warmth and natural alkalinity, a veritable culture chamber for bacteria.

Decay of teeth is due to the action of germs when their protective covering of enamel has become broken or otherwise destroyed. To keep the mouth and teeth in good condition they must be thoroughly cleansed morning and night with a brush which is neither too soft nor too stiff, and which has longer bristles at the end than at the middle. The motion in cleaning the teeth should be made from the gums downward on the upper teeth and upward on the lower.

Water that has been subjected to a high heat usually contains no disease germs, so it is better to use from the hot rather than from the cold water tap for cleaning the teeth. Apply daily a tooth paste made by a reliable house. Dentists advise us not to

use tooth powders unless they are very fine, smooth, and contain an antiseptic, and the mouth must always be well rinsed afterward to completely remove either paste or powder.

"Riggs Disease" begins in the gums around teeth which have not been habitually well cleansed. Bacteria get into the space between gum and tooth—a nice, warm place, in which they may grow undisturbed. You know how this disease causes the teeth to drop out, if it is not recognized early and treated by a skilled dentist. The care of children's teeth from the time they first appear is of great importance if they are to serve their purpose well. In those countries where good dentists are only to be found in large cities, the teeth usually fall out early, thus not only tending to shorten the span of life of the people, but to produce ill health and make them seem old

long before the time when age should cause feebleness.

As I write I am seeing in imagination the great army of lovely American girls to whom these letters are addrest. In no country are there so many as in our own dear land. Do, I beg, appreciate the privileges that are yours in this best of all centuries. Responsibility is the twin sister of privilege; you can not escape it, therefore strive to meet it with an intelligence born of knowledge.

Letter Eight

HALIFAX, NOVA SCOTIA

Letter Eight

HALIFAX, NOVA SCOTIA.

My Dear Girls:

Up to the present time our sex has not shown conspicuous originality in the field of scientific investigation. Altho much good work is being done by women in the research laboratories of the country, few as yet have succeeded in making great discoveries. In spite of our shortcomings, however, quite a large body of girls and women have of late been making one of the most daring experiments (?) of the age: that of exposing the human body covered only by gauze and lace to the cold of our northern winters.

The offices of clothing are threefold:

1. To cover the body for the promotion of morality and decency.

2. To protect it from injury, and to aid in maintaining the normal body temperature.

3. To enhance the attractiveness of the individual.

In conducting the experiment (?) to which I have referred, all three of the purposes of clothing have to some extent been lost sight of:

1. Body coverings have in too many instances been insufficient to comply with the first requirement.

2. No regard has been paid to the conservation of body heat.

3. As to enhancing the beauty of the individual—well, tastes differ.

Physiologists and biologists will tell you that most living organisms tend toward death through loss of body heat. To make good this loss, elaborate chemical changes go on within the body. To these I referred in my letters on nutrition and

waste. In animals radiation of heat from the body surface is minimized by the coverings nature has given them, *viz.*, hair, wool, fur and feathers. Man, coming into the world without these, has learned to replace them by clothing that he adapts to the varying climatic conditions to which he is subjected, and individual differences exist that make it necessary for one person to wear more clothing than another.

Nevertheless, the law of loss of heat by radiation, and the need of modifying and controlling it by means of body coverings remains active, and will as long as the structure of the human body continues unchanged. Do you remember, girls, all those open mouths of perspiratory tubes upon the surface of the skin, through which moisture almost constantly exudes? To be hygienic, clothing must control the rapidity of evaporation of this moisture, by causing it to vaporize, slowly in the

cold days of winter and rapidly in the heat of summer. In this way loss of heat may be prevented when body heat is needed, and its rapid dissipation is assured when the body temperature tends to rise too high. Fibers of silk and wool absorb and hold within themselves the moisture with which they come in contact, permitting it to evaporate slowly, hence clothing made of these is peculiarly adapted to the needs of the body in winter and in the cool days of spring and fall.

On the other hand, while cotton and linen fibers absorb moisture easily, they do not hold it, but permit the rapid evaporation by which the body is cooled. Garments made of cotton and linen are, therefore, adapted for use in warm weather, and to those who naturally generate heat rapidly. A mixture of wool or silk, with a little cotton or linen makes a more durable fabric than either wool or silk alone, and does

not greatly lessen the value of either as a conserver of body heat. Garments of light weight, are more hygienic than the heavy ones which were more commonly worn when woven underwear was first introduced than at the present time. When needed, the addition of a second garment gives more warmth than can be derived from one thick one, and it permits the wearer to adapt clothing to the varying atmospheric temperatures. The "union suit" is very popular, and deservedly so, since it covers the entire body equally and with great smoothness. For winter wear woven undergarments should extend quite down to the ankles, because the extremities, being farther from the heart and large blood-vessels, need to be clothed more warmly than the trunk, rather than less, as is a common custom among girls. Loose cotton drawers may be worn in winter in addition to those of silk or wool, and

stockings should not be as thin as lace, but of substantial weave. Abundant evidence has accumulated to make the truth demonstrable that frequent chilling of the legs and feet is productive of painful menstruation and sometimes of serious diseases of the pelvic organs.

We come now to the question of the corset, and this is a question indeed, for the garment has both good and bad qualities, and is one of long-lived popularity. When made of thin porous material that does not imprison the moisture of the skin beneath it; when well fitted and cut low to avoid injury to the breasts and nipples; when sufficiently long in front to reach quite down to the pelvic bone; when adjusted lying down, not standing, as is the common custom, the corset need not be injurious to a healthy mature woman. In some conditions, indeed, it meets definite needs as a surgical appliance. The oppo-

site of this, a short, badly-fitted corset, made of impervious material, tight at the belt line or just below it, and adjusted in a standing position, is one of the most harmful garments a woman can wear. A young girl, in my opinion, should never wear a corset. It constricts and unbalances the body, thus interfering with free muscular movement, and preventing natural growth and development. What would you think if the young men you know, who are growing into splendid physical manhood, should put on corsets? They would much better do it than you. The effect upon the future of our race would, I believe, be less harmful.

Dr. Robert L. Dickinson, of Brooklyn, N. Y., who has made an exhaustive study of the corset and its influence, does not like it any better than I do. He says, "if a corset is to be worn, it should be made with the cloth cut on the bias in front, its lines

all running a little diagonally instead of vertically; it must be low, or else quite high across the breasts, so that it will not strike them, but will serve as a support if they are heavy; below, it must reach quite to the pubic bone; it must be adjusted while lying down and when unfastened must not spring apart more than two inches, even when a long breath has been taken." In all this I quite agree with him. There is much more that can be said for and against the corset. My last word to you is: do not wear a corset before you are sixteen or eighteen, nor then if you can make up your mind not to do so. If you do put it on, wear it loose and keep your clothing loose over it. Have two lacers, one for the lower half, which you may draw fairly snug; the other for the part above the hip line, which should always be so loosely drawn that you can almost turn around in it.

"What *may* we wear?" I hear you ask. Adhere to underwaists similar to those you wore in childhood, to which the skirts fasten. They can be made very pretty and dainty, and they are hygienic. The so-called "tape girdle" on the market, when worn loosely, marks the belt line, only your skirt must be buttoned to a waist of some sort at the back, to keep it from pressing on the front of the abdomen when you sit down. Clothing hanging from the shoulders is best of all. There are several styles of well-shaped, ready-made, hygienic waists on sale which are desirable if you can find those that fit you.

Be careful not to wear high, stiff collars and tight neckbands. At the present time we are seeing quite too many enlarged thyroid glands (goiter). If there were as many in men as in women, we should certainly attribute them to the pres-

sure of tight collars. The thyroid gland lies across the front of the neck just below its middle, and, the blood flowing through, receives from it substances that have a profound influence upon the work of the body. The habit of dropping the head toward a book or sewing, is harmful to this gland; so also is that of thrusting the neck forward with elevated chin. Remember the imaginary trolley wheel on the top of your head when you are studying, and "keep it up to its wire." You should have a "book rest" to place on the table or desk before you on which to support your book. All school desks should be made with such rests to keep girls from doubling over at their work. Utilize a pile of books for the purpose if you can get nothing better.

Now a word about footwear. Our feet are made for use, not for show. Therefore they should be drest comfortably, and

with boots sufficiently thick to prevent the feet from becoming chilled. The soles of shoes should be wide and quite straight along the *inner* side. The heels should be broad and of medium height. High, or very low heels tend to produce bad habits of posture and ill health. Rubber overshoes should always be worn when the ground is wet; it is better to do so than to wear soles thick enough to keep the feet dry without overshoes, as wet leather absorbs too much heat from the feet while drying. Slippers and low shoes may safely be worn indoors, but not in the street, except in the summer time.

I shall not venture to give you much advice about outside clothing, gowns, hats, etc., except to beg you most earnestly not to adopt foolish and extreme fashions. I used to think that American women were sufficiently developed mentally to have the ballot given them, but since so many good

women have of late worn insufficient clothing and followed fashions which tend to immorality, I have had some doubt about it. It remains for you, girls, to make fashion a servant and benefactor rather than the taskmistress it is to-day. Do not forget that a woman's dress is her exponent and interpreter, for very few of those we meet ever know the *real you* and the *real me.* Too often we oblige them to form an opinion of us which is quite erroneous, because we are so disguised and misrepresented by our dressmakers and milliners. It would be ideal to have only those persons make our outside garments who know and love us, for then they would be able to make them express what is best in us. Women's clothing may be more cumbersome than that of men, but what sort of place would the world be with no more color in dress, than that which is given by men's clothing? Cherish your exquisite

colors, your dainty fabrics, and as much of flowing grace of outline as suitability to use and prevailing fashion will permit, but refuse to be drest in styles which are unbecoming, and immoral in their tendency. To be and to seem, truly feminine and altogether womanly, whatever our position or occupation in life, should be our high and constant aim as American women.

Letter Nine

WOLFVILLE, NOVA SCOTIA

Letter Nine

WOLFVILLE, NOVA SCOTIA.

My Dear Girls:

I wonder if you know how closely the nervous system is connected with all parts of the body. The relation is so intimate that if it were possible to dissolve out every other organ and tissue without disturbing it, we should have left, in nerves and their many minute divisions, a perfect tracery of every part of the human body. This indicates that organs and tissues throughout the body are dependent upon the nervous system for power to perform their functions. On the other hand the wonderful telephone-like "receivers," found at the surface ends of nerves, show that the nervous system itself de-

ward *from* nervous tissue cells to muscle fibers.

It was a notable day when Sir Charles Bell demonstrated the fact that one set of nerve-fibers is sensory and the other motor, and that, altho they may be bound together in a nerve bundle, neither is competent to assume the function of the other.

FIG. 36
A nerve split lengthwise

The brain, spinal cord and nerves which proceed from them are called the "cerebro-spinal nervous system." A number of smaller groups of cells, belonging to the nervous system, lie along the spinal column within the chest and abdomen and in other places. These have quite a different function, for they preside over the work performed by

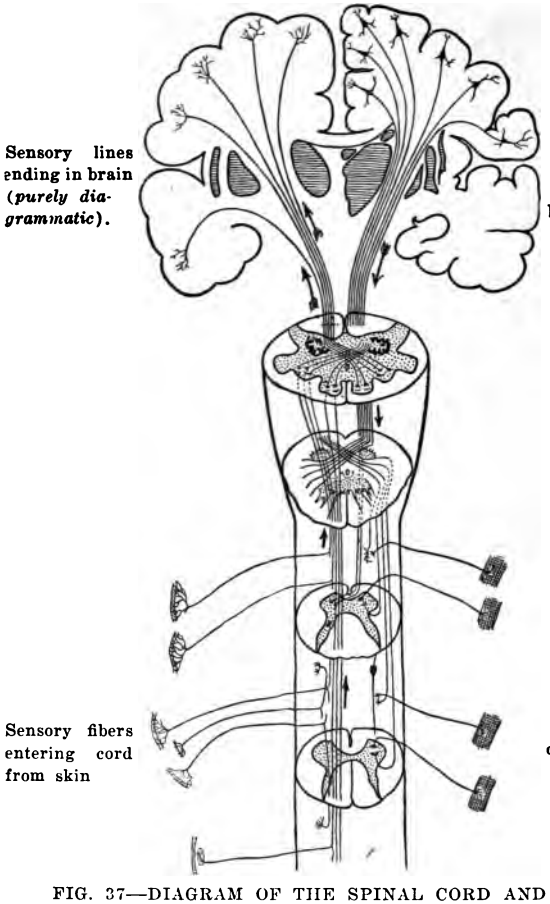


FIG. 37—DIAGRAM OF THE SPINAL CORD AND BRAIN

Showing sensory fibers entering on left and motor fibers leaving brain on the right

the organs of the body, and have nothing whatever to do with sensation and body movement. To these small masses the name ganglionic nervous system has been given, because the cells of which they are made up, and the fibers which proceed from and connect them, form ganglia or chains. The work of this smaller section of the nervous system, altho less showy than that of the cerebro-spinal, is quite as important.

The two systems are connected by exquisitely arranged nerve-fibers which enable them to work in harmony with each other, and to unite in doing some kinds of work, as that of controlling the amount of blood which shall enter the capillaries of a region at a given time. For instance, when the usual hour for a meal arrives more blood must be sent to the stomach to supply the necessary nutriment to the gland-cells which secrete pepsin, rennin,

and acid required to digest the incoming food, and it is the office of these vaso-motor nerves, as they are called, to see that it goes there in proper amount. At the same time impulses from the ganglionic system are sent to the secreting cells in the stomach wall to stimulate them into activity. A little later motor impulses from the cerebro-spinal centers arrive, and set the muscle fibers in the stomach walls contracting. By means of these contractions the food which the stomach contains is moved about, mixed with the gastric secretion, and finally carried into the intestines beyond. Thus it is, that while more or less separate and distinct in structure and function, the cerebro-spinal and ganglionic systems are yet one, and together conduct the important work which the organs of the body carry on.

The cells which make up the nervous

system are the most delicate and easily injured of any in the human body. They are also more dependent upon a constant supply of nutrient material for their power to function than are other cells.

The blood with which the brain is nourished, reaches it through four large arteries. Inside the skull these send communicating branches to each other, so that if one line becomes closed, the others are able to maintain the blood supply until it is again open. An elaborate system of veins, some channeled in the interior of the bones of the skull, provides a free exit for the blood that enters, thus safeguarding the brain from harmful pressure, due to an over accumulation within its vessels.

Occasionally it happens that the heart temporarily ceases to contract with sufficient force to fill the blood-vessels of the brain. This produces the partial or com-

plete unconsciousness which we know as faintness or fainting. The skin of the face becomes ghastly white, telling the tale of lack of blood in the head, and the pulse at the wrist is almost or quite imperceptible. Altho this condition is startling, it is not usually attended by much danger, for the heart does not really stop beating, and soon takes up its work again with renewed energy. It is, however, very important to retain in the brain as much as possible of the blood already there, as well as to make it easy for the heart to send to it a new supply, and so, when a person is faint, we lower the head and loosen the clothing around the neck and chest. Every one ought to know that to drop the head upon the knees, or to stoop as if to pick something from the floor, will usually prevent complete fainting with all the annoyance it entails. It is a great mistake to get up and attempt to walk

when faint, as it hastens the emptying of the vessels of the brain, and increases the trouble. To try to descend a flight of steps in this condition is a very dangerous procedure and should never be attempted. Do not allow yourselves to become frightened should a slight faintness come on, for fear will precipitate that which you dread. Just drop your head low and assure yourself that it will quickly pass over.

Sometimes the walls of the blood-vessels become weakened by disease, and in middle-aged and old people it is not uncommon for a vessel in the brain to break, producing the condition called apoplexy, or hemorrhage into the brain tissue. If the broken vessel chances to be small, its rupture may not cause death, altho a temporary paralysis of some of the muscles of the body is likely to result with loss of sensation. The human body, however, manifests a wonderful power of repair,

and when anything happens within it, the cell workmen in charge of its repair-shops, so to speak, hasten to the spot, and, if possible, mend it up, making it as good as new.

By an economic grouping of cells and communicating fibers the work of the brain is carried on in regions or centers more or less distinct from each other. For instance, the cells that preside over the sense of smell are located in that portion of the brain that lies above the ears, whereas the centers for hearing lie farther back. The optic groups of cells are located at the back and lower part of the hemispheres. Near the center of the brain are two important masses of cells that receive for distribution to their appropriate centers, all the incoming messages on sensory lines, while other groups above them are responsible for the work of starting motor impulses outward. Behind the fore-

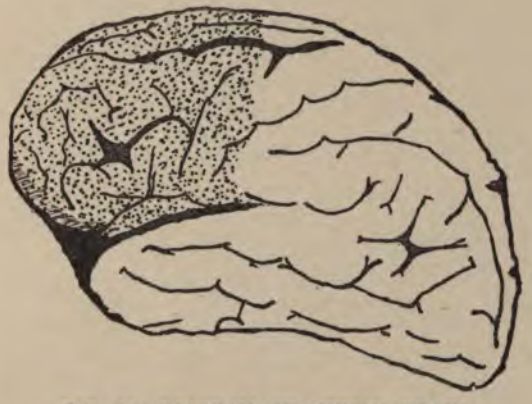


FIG. 38—DIAGRAM OF HUMAN BRAIN
Psychic region shaded

FIG. 39—DOG'S BRAIN
Psychic region shaded

head and above the ears are the frontal lobes of the brain, where lie grouped the psychic cells, whose great function is to think, to reason, to philosophize. The emotions, the will, memory, and the centers that make articulate speech possible—all that elevates man above the beast, and allies him with his Creator, are centered in this portion of the brain. To them come lines of communication from the other regions I have mentioned, and from them pass to motor-cells the projection fibers by which muscular movement is accomplished.

The spinal cord is a sort of "subway" for the transmission of motor and sensory fibers between brain and body; it also contains nerve centers more or less independent of those in the brain. Along the front of the cord the motor fibers are spread, while the sensory fibers form a band down the back of it. Through small

bony openings along the sides of the canal, both motor and sensory nerve fibers pass to and from muscles and skin.

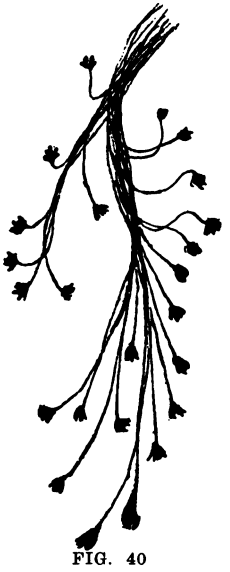


FIG. 40
A motor nerve, showing its constituent fibers and the plate-like "transmitters" at their muscle attachment

Through orifices in the bones of the skull, twenty-four nerves pass out from the brain without going by way of the spinal cord. These are the nerves from the centers I have described, which preside over the special senses. Added to these are the nerves that control the muscles in the heart and stomach walls, the diaphragm, and those that move the eyelids and the muscles which give expression to the face. If from disease of the bone through which they pass, or from

other causes these nerves are injured at their point of exit, or become separated from their centers in the brain, or if their connection with the psychic cells is broken, their efficiency is at an end.

Possibly you may sometime have seen a person, who, after a severe inflammation of the ear, has not only lost the sense of hearing, but also the power to move the muscles of the face on that side. The eye remained open in spite of every possible effort to close it, and in laughing the mouth drew toward the opposite side. The nerve of hearing and the motor nerve to the face muscles were destroyed where they pass out through that part of the skull in which the bone became diseased, and, of course, nothing could be done to restore either the sense of hearing or the power to move facial muscles. I have given you this illustrative case girls, that you

may realize the gravity of the affections that involve the orifices of the cranial nerves. Always remember that a good surgeon, if called early, can prevent the destruction of those important nerves, even tho the bone may become diseased.

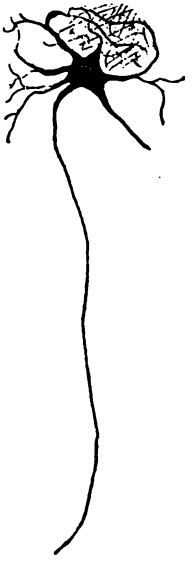


FIG. 41
1—Nerve cell in the brain
2—Cell poles
3—Nucleus
4—Fiber which, joined with others, will make a nerve

The brain of a newborn baby is almost entirely undeveloped. It reminds one of a beautiful field of untrodden snow. Those nerve paths only are open that are necessary to the processes of life, such as breathing, swallowing, sucking, kicking and crying. As the nervous system develops and stimuli from without reach it, new paths are made

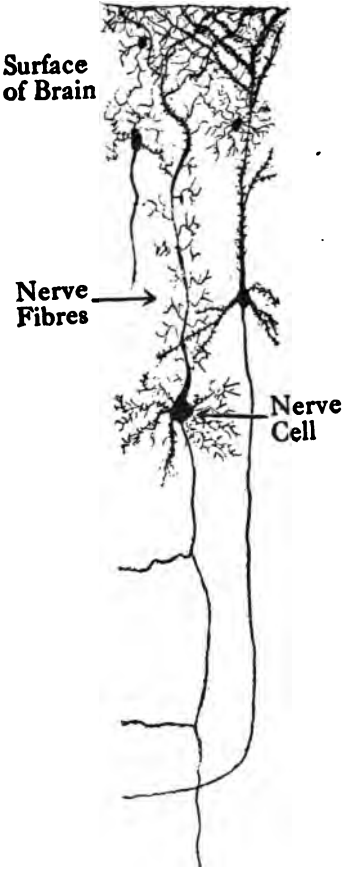


FIG. 42—BRAIN PATHS

between centers, and one by one they connect with the psychic and motor cells, until that once almost trackless field, becomes covered with paths over which messages fly with lightning rapidity.

Has your mother ever told you how she felt when the first smile flickered across your face in response to her

repeated efforts to elicit it? Do you know what that baby smile of yours signified? It meant that your brain lines were open. You had seen her face, heard her voice, formed a tiny concept, and had sent a message out to the muscles of the face, which proclaimed the fact. Your mother's heart was glad, because at that moment she became assured that your psychic cells were normal. Intelligence and reason waited only for time and the necessary stimuli from without, for their development.

When the brain tissue is imperfectly formed the time is long, ah, how wearily long, ere the answering smile appears, and alas, it may never come! Is there anything more sad than a well-formed human body with psychic cells incapable of development? Yes, girls, there is! A naturally perfect brain, possest of all the potentialities for good, but in which those qualities of mind hold sway that degrade and drag

its possessor down to a condition below that of irresponsible brutes—this is worse, a thousand times worse, than an undeveloped and unthinking brain.

I have written you this long story about the structure of the nervous system for a purpose. I wish you to realize your responsibility for the care and right management of your own. You have seen that every organ and tissue of the body is dependent upon the nervous system; that your ability to think, to learn, to appreciate the beautiful; that your conception of God, the Creator of the body, and your hope of eternal life, are all yours by virtue of the psychic cells with which you have been endowed. You know that an organ or part can only function well, when properly nourished and when given opportunity for rest and recuperation. More than any other part of the human body the nervous system is dependent upon nutrition, exer-

cise and rest for its health and ability to perform its varied functions.

More promptly than any other tissue this system suffers from waste substances and poisons coursing in the blood, from lack of oxygen, from the cutting down of the water supply of the body, and from continued bodily and mental strain. It behooves us all, then, to study the needs of the nervous system and the laws under which it acts, that we may make our lives conform to these as far as in us lies. We ought to surround ourselves with such mental stimuli as will call forth the best nervous reactions, and avoid as we would "the plague" those influences that by suggestion are likely to prove harmful to ourselves or to others.

Into the hands of ignorant and untrained parents, both rich and poor, come the little babies with brain fields untrodden. Instead of the wise laying out of

paths, and the cultivation of those psychic cells that make orderly living easy, suggestions that tend to evil, are permitted to reach them from the right and from the left. Stimulation of the nervous system, while it is yet too incomplete to bear it; late hours, improper food, under and overfeeding, and many other things add their detrimental influences. Then comes the school life, with its long hours, and too often its wrong methods; its teachers who lack practical knowledge of the body structure in general, and the nervous system in particular; its crowding and cramming, and its attempt to make all young minds fit into the same mold.

Do not let this treatment of children go on, girls. When you become women you will make a great army, and an army can conquer where single-handed we fail. You can change conditions in American homes, in schools, in society. To that end let every

girl who reads this, determine to do her part toward creating an environment for children, that will help to make better citizens and a stronger nation. Begin with your own thought life, for our thoughts are the mother of our deeds. They have extension and diffusion lines throughout the body, too delicate and subtle to be demonstrated, but which affect it for good or ill.

You doubt this, do you? Have you ever watched children on the street when a rollicking tune was being ground out of a hand organ? Their feet at first moved lightly, and then began to dance, keeping time with the music. Your own step changed, unconsciously, as you passed, and you would have understood had you stopt to think about it, why the long day's march of a regiment of soldiers is made easy by the music of a band. Enter a cathedral or a great church when the

deep-toned organ rolls out its slow and measured notes. The feeling which takes possession of you is one of solemnity and awe; the world outside fades from your thought; prayer becomes easy. It is because organ music affects brain and body in this way that it has been introduced into churches the world over. You have only to compare it with the music of the ball-room, to be sure that it moves from psychic cells body-ward, on different diffusion lines.

Let us consider the effect upon the body of other psychic states. You were perhaps hungrily eating your dinner one day, when a telegram was brought you containing the sad news of the sudden death of your best beloved friend. Did you go on eating? No, your appetite suddenly left you and digestion stopt, your face became pale, soon your chest heaved and tears began to fall. Why this sudden change?

the effect of the sad news upon the psychic cells was conducted outward to the body on many lines; to the secreting glands; to

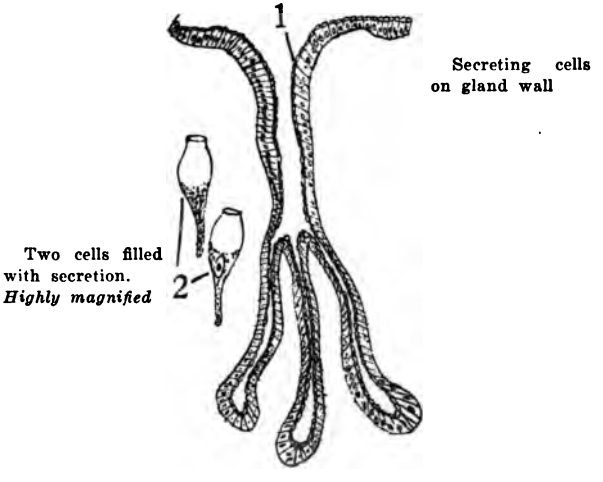


FIG. 43—A SECRETING GLAND IN THE MUCOUS MEMBRANE LINING THE STOMACH

the muscles in the stomach walls; to the skin; to the muscles of the chest and face; to the vaso-motor nerves that control the blood supply to the capillaries in the region of the eyes and to the tear glands. That which you thought and felt was dif-

fused throughout your body, temporarily affecting the function of nearly every part.

Illustrations like these might be multiplied almost indefinitely to prove that suggestions which reach the brain from without have power to impart to the body a sense of lightness and well-being, or to interfere with its nutrition and lower its vitality.

The body itself is almost as fertile a source of suggestions as the world outside, many of which stir activities within the brain, that, as they pass out again on body lines, are highly detrimental. The condition which you have heard called hysteria is one of these. In this state the whole body, as well as the brain, becomes unduly responsive. It is like a pair of unruly horses with an incompetent driver behind them, some one else needs to take the reins until the driver—the will—becomes better trained and the horses less restive.

There is reason to believe that the number of cells in the brain that undergo development, even in those individuals who are most intelligent and learned, is far below the whole number that it contains, and which might be developed, if life were long enough and the needed stimuli could reach them. Heredity, environment and education, together with the choices and decisions of the individual himself, decide the development of specific brain cells.

The psychic cells in which are located the emotions of fear, anger, envy, jealousy, etc., respond early and easily to stimulation. This is probably due to the fact that in primitive man and in animals these cells were more often stimulated than others. It is an unfortunate inheritance of our race, for unless reason and other mental qualities are cultivated to control their activities, before we are aware they assume a command that is fatal to the best

development of the brain and body. One of the first things for us all to do, therefore, is to close off as far as possible the paths that lead to and from these harmful emotion centers. The cells which preside over self-esteem, self-confidence and selfishness also belong to the number of those whose paths need to be guarded most carefully and continually, because their over-stimulation works injury to character. There is little danger, on the other hand, of the over-development of the psychic cells that make us honest, courageous and persevering, or of those that preside over the higher intellectual activities of the mind.

In my first letters, girls, I urged upon you the importance of keeping your bodies symmetrical, and I endeavored to give you the teaching that would enable you to do so. I now urge upon you the greater importance of acquiring that fine *mental*

poise which assures to its possessor a place of influence and helpfulness in the world, and I have suggested some of the ways by which you may attain it. In closing, may I say to you that I know of nothing that possesses such power to steady the mind as a sense of nearness to God and an intimate personal relation with Him formed early in life. We know that we are dependent upon Him for that which we are, and all that we can be. It, therefore, is but reasonable that we should acquaint ourselves with Him and permit Him to guide us as we endeavor to find the path that leads to Health and Happiness.

Letter Ten

JAFFREY, NEW HAMPSHIRE

Letter Ten

JAFFREY, NEW HAMPSHIRE.

My Dear Girls:

A whole year has passed since I wrote to you from Wolfville, Nova Scotia. My vacation came to an end too soon, to permit me to complete the series of letters that I had planned to write. You are now a year older, and doubtless you will understand and appreciate my remaining letters better than you could have done a year ago.

This is to be a real heart-to-heart letter —one I should have found it difficult to write while we were moving about so much.

We are now spending a few days in one of the most quiet and delightful spots in New England, and, as I write this, I am

sitting on the steps of an empty cottage at the edge of a beauiful wood. A chattering squirrel is the only living thing near, so I feel that I am writing to each of you girls individually, and therefore, can consider without fear of being misunderstood, the most sacred and beautiful things which concern the human body and our lives.

The earnest faces of two hundred college girls come before me at this moment, as I saw them looking into mine some months ago while I spoke to them about "Woman's Mission and Her Physical Preparation For It." The close and sympathetic attention they gave, throughout my address and the kind words they spoke to me afterward, encourage me to hope that you will welcome my teaching as they did.

In explaining the meaning of the term "Woman's Mission" I gave them this

definition, which I some time ago formulated: "To impersonate and promote purity, honesty, temperance, unselfishness, gentleness and high, Christian, intellectual and æsthetic culture; to cooperate with man in home-making, child-bearing, rearing and educating, and in advancing all the best interests of mankind."

The first part of this definition indicates what we should all aim to be, and do you know, if every girl and woman in the world were to live up to this standard we should be such a great and overwhelming force, that we could at once raise the moral life of the world to its ideal place.

It is about the second part of the definition, however, that I wish to write in this letter. You may think that you do not need this teaching for a while, but just as the farmer prepares his ground and sows his seeds long before he can hope to raise grain, so you need now to be preparing

for woman's God-given work, the noblest and greatest that is done in the world, *viz.*, home-making and child-bearing.

Have you ever thought what would happen if no more children should be born for one hundred years? At the end of that time there would probably not be one human being on the face of the earth. New York City with its soaring buildings, Rome and Florence with their historic treasures—all the cities of the world would stand silent and desolate.

Home-making in cooperation with the one man a woman holds most dear, and child-bearing, rearing and educating, while not woman's only mission, is her highest one, not alone to populate great cities, but to people them with men and women in whom she has implanted high ideals and who are strong in purpose in the direction of "purity, honesty, temperance and high intellectual and Christian culture."

Fortunately, while preparing for this, a girl is also fitting herself to undertake almost any other work in life, for mothers need to know everything that can be learned. In this letter I can only write about the necessary physical preparation for the beautiful life before you.

In all I have heretofore written about body-cells, I have not mentioned the two particular groups which I shall now describe. The number of cells that they contain is not too great to be counted, tho I doubt if it has ever been done. These two groups are safely hidden away in the center of the pelvis of girls and women and are called ovaries, the microscopic cells they contain are ovules. The ovaries are made up of a framework of fibrous tissue in which lie the ovules in their Graafian follicles, as their enveloping sacs are called. These follicles, lined with epithelial cells, are surrounded by capil-

lary blood-vessels. In size the ovaries do not measure more than one and a half inches in length by three-quarters of an inch in breadth. In shape they resemble almonds or lima beans, and weigh but little more than good-sized ones.

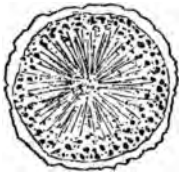
Each little ovule is made up of the same proximate principles which we found in other body-cells, *viz.,* water, protein, carbohydrate, fat and mineral salts, and yet under conditions which God has arranged, marvelous changes may take place in these cells, changes which, when once begun, do not cease until a dear little baby is placed in its waiting mother's arms.

Let me tell you a story. One hot Saturday evening long ago, before any of you were born, I suspect, a friend and I sat down before our microscopes to examine some material that our professor in the summer school of biology had that afternoon given us. In the glasses before us

floated some whitish granular specks; under the microscope we at first saw only small, clear, round cells, each having in or near its center a nucleus. Soon, however, we observed moving cells, also, many of which looked like living organisms as they propelled themselves across the field of the microscope. In shape each of these tiny cells was oval and had attached to one end a whip-like prolongation, by the lashing motion of which it propelled itself. I saw one of those curious moving cells in its aimless wanderings come in contact with one of the larger nucleated cells first observed. Instantly its vibratile motion ceased; it rested a moment and then pushed its way into the nucleus of the larger cell, the whip-like end disappearing last through its clear outer layer. Before we could express to each other the astonishment we both felt over this, to us, strange occurrence, I noticed a change in

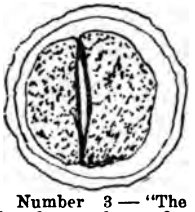
the nucleus (the most concentrated part) of the cell I was watching. It became a little cloudy, and in a moment I fancied I saw a line run up its center. My friend observed the same in the cell she was watching under her microscope. The line deepened to a fissure, and the fissure finally divided the nucleus in two. I turned to make a diagram of the changes I had seen, and when I looked again, another line forming a right angle with the first had appeared, crossing the original nucleus. As before, it deepened to a fissure and finally cut each tiny mass across. Where at first there was but a single nuclear speck there were now four. This process of division went on until the transparent outer portion of each cell was crowded with small new cells, and looked as if a veil of lace had been drawn over it.

Soon another change occurred: instead of crowding the enclosed sac evenly, these



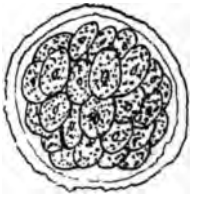
Number 1—"Small, clear, round cell (ovule), having near its center a nucleus" Nucleus at center Outer circle indicates cell membrane

Number 2 — "It rested a moment (the sperm cell) and then pushed its way into the nucleus, the whip-like end disappearing last"



Number 3 — "The line deepened to a fissure and the fissure finally divided the nucleus in two"

Number 4—"Where at first there was but a small nuclear speck there were now four"



Number 5 — "The transparent outer portion of each cell was crowded with small new cells"

FIG. 44——"THE STORY"

new cells began to move toward the circumference of the cell-chamber in which they had formed. Then in two ranks they gathered, leaving a clear space in the center where the nucleus had been. Then an opening of the ranks on one side changed the rows of cells from a circle to a horseshoe shape. Now, alas, the cell outlines began to grow opaque. I watched until it became an enlarged dark mass which my sight could no longer penetrate. Our study ended, we sat in silence, for the great mystery of life's beginning had opened before us. Our professor had put into the glasses of water he had given us, some small masses of cells which he had removed from the bodies of two little "Sea Urchins," as the Echinus is called. They were male and female. In the drop of warm sea water containing them that we placed under our microscopes, the small, active sperm cell from the male found the

Number 6—Division of nucelus, first stage

Number 7—Division of nucleus, second stage

Number 8—Division of nucleus completed

Changes in the cell more highly magnified

ECCHINUS OR SEA URCHIN
(Dried Shell, life size)

FIG. 45—THE STORY

larger ovule of the female, entered it, and as a result of this union, the marvelous changes began within the nucleus, which forever have, and forever will accompany the beginning of a new life. Somewhere within those microscopic cells was hidden the vital formative element, which acting under God-given laws, inaugurated the building of a new body *like those from which they came.*

I have told you this story, girls, that you may better understand the great and sacred office of the organs which I am describing.

Closely connected with the ovaries in the pelvis are the two *ovarian tubes.* They are four inches long and have trumpet-shaped ends, which open near the ovaries, and are bordered by a delicate fringe of finger-like processes. The tubes grow smaller as they approach the uterus, or womb, with the upper and outer angles of which

they are continuous in structure. So small, indeed, is the doorway between the two that a cambric needle will scarcely pass. The uterus, or womb, is a thick-walled, pear-shaped sac which hangs in the center of the pelvic cavity with the broad end, called fundus, above and tilted a little forward.

In addition to the two tiny openings into the ovarian tubes the uterus has an orifice or mouth located at its lower and smaller part. While this opening is larger than the two above, it will only permit the passage of a small probe.

The uterine walls are made up of muscle fibers, most of which are undeveloped, and of fibrous tissue that binds them together and gives strength to the organ. A large number of blood-vessels traverse the walls of the uterus and make a rich capillary network within the delicate mucous membrane that lines it. There are nerves, also,

which, prest upon unduly by over full vessels or contracting muscles, cry out, so to speak, with pain, just as do those in the walls of the intestine when one has a colic.

The uterus is a small organ, not more

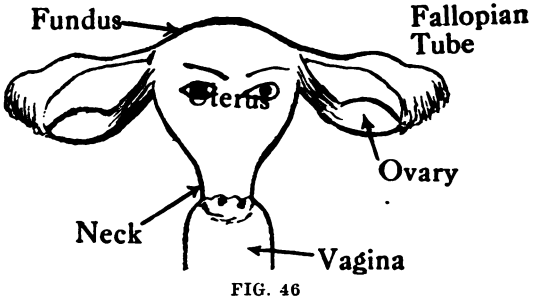


FIG. 46

than three and a half inches at its widest part by four long. Smaller, you see, than a letter of ordinary size, and not much heavier, when its blood-vessels are not over-distended with blood. Its cavity is so small, owing to the thickness of its walls, that it will not hold more than a teaspoonful or two of fluid. It rests upon

and is continuous below with the vagina, a tube four or five inches long and about as large around as the cover of a silk umbrella. This tube is simply a passage-way to the outside of the body not unlike the æsophægus, through which food passes to the stomach. It is lined with mucous membrane and lies in close contact with the rectum at the back and the urinary bladder in front. So closely is the vagina fastened to these organs, and so firm is its floor below, that it is about the best support the uterus has. Because of the peculiar function of the latter it is necessary that it shall be very loosely held in place. To accomplish this a layer of peritoneum, as the delicate serous lining of the abdomen is called, sweeps down and covers the fundus of the uterus, thickens as it turns backward, clasps the rectum, and is attached to the front surface of the sacral bone. In front it spreads across the back

surface of the bladder and fastens to the front wall of the pelvis in the same manner. These are called the posterior and anterior ligaments of the uterus, altho they are not true ligamentous structures at all. Two more folds of the peritoneum which envelop the uterus, spread out over the tubes and ovaries, and fasten to the bony pelvis at its sacral borders. These folds are called the broad ligaments. They have been compared to the open wings of a bat, the uterus representing its body.

In addition to these various loose folds there are two *real* ligaments. These are round and start from the sides of the uterus just below the ovarian tubes, turn upward and forward, pass through a small canal in the muscles of the abdominal wall along the upper border of the pelvis, spread out and fasten to the thick skin in front of the pubic bones. When these ligaments are well developed they serve

as "stay lines" to prevent the fundus of the uterus from falling backward against the rectum. In delicate girls who have played with dolls and read books instead of running and climbing and doing gymnastic work, all these uterine supports usually lack strength and firmness.

I have described these organs in detail because their great function is reproduction; they are the wonderful organs of motherhood, the crowning glory of woman's life. "I can not tell you how happy your teaching has made my married life," many a young mother has said to me. This makes me feel sure that I am doing you, girls, a kindness in giving you the same teaching.

We must return now to the fortunes of that tiny maturing ovule which in the early part of this letter I left in its little Graafian follicle, to tell you the story of the beginning of the little sea urchin's life.

[illegible] and [illegible] whether it [illegible] we will [illegible] years of age. [illegible] an order [illegible] before for [illegible] of repro- [illegible] with it [illegible] had [illegible] The breasts [illegible] began [illegible] under the in- [illegible] the whole body [illegible] awakening [illegible] of the increased [illegible] membrane of [illegible] began to collect in the cavity of that Graafian follicle, and one day when it had become full the fringe-like fingers on the trumpet-shaped end of the ovarian tube swelled up and clung to the ovary as if afraid it would get away

from them. Then the wall of the follicle (sac) burst, and out spurted fluid and mature ovule straight into the little grasping tube end. The fringe-like fingers let go their hold and the little ovule, propelled mainly by the contraction of muscles in the wall of the tube, began its slow journey through the three or four inches of ovarian tube to the uterus. You know that nearly all

FIG. 47
Ciliated epithelial cells from lining of fallopian tubes

tubes in the body have muscle fibers in their walls; the ovarian tubes have, in addition to these, multitudes of microscopic, hair-like projections from the epithelial cells with which they are lined. By the slow movement of these toward the uterus the little cell was helped on its way.

About the time the distended follicle in the ovary ruptured the capillary vessels in the mucous membrane lining, the uterus became so distended by the extraordinary amount of blood the nervous system had sent to the organs of reproduction, that they also burst and blood oozed from them into the cavity of the uterus. As soon as the uterus filled, it emptied into the vagina below, through which the blood passed out of the body.

If that young girl's mother had known what I am telling you, she would before this time have explained to her this wonderful process of ovulation and menstruation and its relation to motherhood. Had she done so, the little girl would not have been disturbed or frightened by the sight of the blood, as so many are who have never heard the story. I told it once to a girl of twelve whom I loved, and when menstruation came for the first time, in-

stead of being frightened, she whispered joyfully to her mother, "Now, maybe I'll have a dear little baby of my own some time. I suppose I can't go to school to-day or to dancing-school to-morrow." Her mother had the fascinating story-book which I had suggested ready for her, and she was quite happy in the promise of a monthly holiday for a while, at home with her sewing and her books.

You ask me wherefore this elaborate periodic process, *i.e.,* the maturing of a microscopic ovule and its slow movement through the ovarian tube into the uterus to dissolve there; this flush of blood and rupture of capillary vessels, producing the outflow so troublesome to girls? Many an afternoon on a great ocean steamer I have watched the "fire drill" that is conducted on deck. When I asked the steward why it was necessary to go through it so often he said, "We are obliged to do so in order

to keep the men ready to act if a fire should occur." These monthly activities within the pelvis may be compared to that fire drill. They are conducted with such care and periodicity to prepare for motherhood when it shall come. That little ovule may sometime—*let us hope only under the holy condition of marriage*—meet on its way through the tube a microscopic sperm cell with which it will unite as did the cells upon my microscope slide, and then will begin those marvelous changes which end in the perfecting of a new being. At such a time a large supply of blood will need to flow through the pelvic vessels, to bring nutrition to the millions of fast-forming cells in the body of the new little being growing there. The uterus, that common cradle of our race, will need a lining membrane most delicate and thin, ready to fold around the little guest. What better could insure both of these condi-

tions than the monthly distension of the uterine vessels with blood, and the monthly removal, flake by flake, of the old lining membrane of the organ, and its replacement by a new one?

Ah, girls, forget small discomforts in connection with menstruation. Remember, it was planned by God, not alone to perpetuate the race, but under right conditions—bear in mind always that I say *right* conditions—to bring to women that deepest and purest joy vouchsafed to human beings, *viz.,* motherhood.

you what this change meant to our sex. In the body of a quadruped the chest and pelvis usually lie in the same horizontal plane, hence the blood makes its circuit from heart to pelvis and back again, unaffected by the force of gravity. The abdomen lies in front of, and hangs below the pelvic cavity; hence, however low the loops of intestine within it may drop, they do not encroach upon the organs lying behind them in the pelvis. In the quadruped, the rectum, through which waste materials from the digestive tract must pass on their way out of the body, is so situated that its contents can not by pressure interfere with neighboring organs.

In the *upright* human body all these favorable conditions are changed. The heart occupies a place high above the pelvis, which makes it necessary for the blood in its return journey to flow directly upward for a distance of from ten to fifteen inches,

according to the height of the individual; furthermore, the long ovarian veins through which in girls and women much of this blood passes, are not provided with valves to aid in its ascent. In the horizontally-placed trunk of the quadruped body, valves are not needed. Because of these anatomical differences the return flow of blood from the pelvis in the human body is liable to be retarded, thus causing temporary congestion, pain, and under unfavorable conditions, disease. The small intestine, as in the animal body, hangs in loops that are loosely fastened to the spine. Under the influence of gravity, bad positions in standing and sitting, and tight clothing, these intestinal loops easily fall into the upturned pelvic chamber, which lies directly beneath them, thereby making undue pressure upon the organs which it contains. The rectum, too, when crowded with fecal

matter, presses upon the organs that lie in front of it in the pelvis.

These unfavorable anatomical changes bear more heavily upon woman than man, because of the great function of motherhood with which she is endowed. We have seen, however, how man by his intellect has learned to utilize the forces of nature and thereby make good his physical losses; so woman, by a knowledge of her own physical structure and its peculiar limitations, may so direct her life as to overcome her inherited physical disabilities, attain health of body and the happiness that it is her right to enjoy.

I have such a profound belief, girls, in your ability to understand, and your willingness to face the situation that confronts us all, that I am glad of this opportunity to give you the instruction that you need; to expect you to control conditions which you do not understand, and avoid dangers of which you have never

heard, is like expecting a man to run an engine or an automobile who has no knowledge of the mechanism of either.

I have already explained to you the wonderful processes by which body nutrition is maintained, and I have told you about that other essential of good health, the constant and complete removal of waste. You know the closeness of the relation between the various parts of the nervous system and the organs of the body! You have seen how bad postures and tight clothing interfere with free movement of the chest in respiration, and now that you have learned the location, structure and functions of the organs of reproduction, you can readily understand how bad postures have the power to deform and displace some of those important organs.

Let us first consider the effect of the postures that curve the spine and produce

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"round shoulders" and "flat chest." The bend of the body inward at the belt line which occurs in these positions lessens the space within the abdominal cavity; tight clothing adds its influence also, and both together crowd the abdominal organs downward. The loops of intestine, often heavy with digesting food and waste matterial press heavily upon the uterus, which being loosely hung in the middle of the pelvis, is crowded downward and finally becomes bent upon itself forward or backward. This may happen at any age, but it more commonly occurs during the years in which the organs of reproduction are undergoing development, *viz.,* from eleven to sixteen. It does not take long for such a bend to become permanent, even tho the weight of intestines may be removed, and it is one of the most common causes of menstrual pain. You will easily understand the mechanism of this if you fill a

hot-water bag half full, double it at the middle, turn it upside down, and see with what difficulty the water will run out. The uterus is a thick-walled bag into which, at the beginning of menstruation blood drips from its lining membrane. A bend in the wall may imprison this blood by closing its outlet more or less completely. When a hard mass of undigested food accumulates in the intestine the pressure it produces upon nerves causes muscular spasm or colic; in the stomach it produces pain and nausea, which is relieved by vomiting, in the uterus imprisoned blood produces muscular spasm and cramping pains. When the vessels in its walls become fully distended, the bend straightens, opening the outlet for the retained blood. With this comes blest relief from pain, but each month it returns, because the mechanical cause of it still remains.

Sometimes the position of the uterus in

the pelvis becomes permanently changed by intestinal pressure, constipation and other causes. The upper part, or fundus, turns backward or forward, while its lower part moves in the opposite direction: the organ is turned on its axis so to speak. Such a change of position predisposes the uterus to disease and causes more or less backache and discomfort, but it seldom produces the colic-like pain that accompanies and is dependent upon a flexion or bend of the organ upon itself. There are many other causes of monthly pain beside bad habits of posture and tight clothing, some of which are insufficient or improper food; too little exercise *between* "periods" and too much during menstruation, such as playing basket-ball or tennis and taking long walks. Cold bathing and night study at this time may cause pain; also the strain of school examinations and social dissipation.

In order to overcome the handicap which

nature has placed upon you in common with other girls and women, you will need to observe carefully the following rules:

1. Keep the pelvic cavity *out from under the weight of the intestines* by retaining in standing, walking and sitting the posture of your childhood, which was with pelvis held a little higher at the back than in front.

2. Give to the organs of reproduction the same consideration during menstruation you ought always to give to the stomach after a hearty meal, *viz.,* a reasonable degree of rest.

3. If the movement of blood from the pelvis back to the heart is slow and difficult, causing pain from congestion, make it more easy by lying down, thus placing the pelvis and heart on the same level. This should only be needed during the first day of menstruation, and during the early years of menstrual life. When the organs have become accustomed to the

periodic filling of their vessels with blood it should no longer be necessary.

4. Avoid mental as well as physical strain during menstruation, and this includes worry, the sense of hurry, and giving free sway to the emotions. Remember the intimate relation that exists between the nervous system and functioning organs, and the influence that our thoughts exert upon the body.

5. Guard against becoming chilled before, during and immediately after menstruation. Take no chances when it is nearly due, in the way of sea bathing, cold plunges, etc. Always consider the date of its recurrence in making plans for unusual activity.

6. Do not permit yourself to regard this function as a burden and a cause for unhappiness. Rather be thankful for the assurance that it gives of normal organs and pelvic health.

LETTER ELEVEN

What can be done to relieve pain when it comes? That depends upon the cause, which varies in different individuals, as you can readily understand. On general principles it may be said that the recumbent position is demanded and the application of heat to relax muscular spasm. That modern comfort in pain anywhere—the hot-water bag—here comes into good service, and, if it does not give prompt relief, a handkerchief wet in spirit of camphor may be placed between the bag and the skin, being careful not to produce a blister. Copious draughts of very hot water, containing a preparation of Viburnum Prunifolium or some other simple medicine, will generally give relief. The use of opiates and alcoholics at such time should be discouraged as the effect upon the general system, and the danger of acquiring the "drug habit" are more serious than the pain itself. If these simple meas-

ures are not efficacious, a physician should be summoned, and when the "period" is over, an examination should be made to discover the cause of recurring pain. Do not let it go on indefinitely; permanent injury to the parts may result, and it is sure to limit your working power in a very serious manner.

The ideal which I would place before you is a healthy, happy, painless girlhood and young womanhood, during which physical and intellectual development go hand in hand. Parents, teachers and wise physicians may do their part toward bringing about this condition, but if you ignore the needs of the body, and wilfully or even ignorantly disregard the laws that God has made for its management, do not be surprized if pain and sickness are your portion, and if you find that life holds for you more of failure and disappointment than of success and happiness.

Letter Twelve

BROOKLYN, NEW YORK

Letter Twelve

BROOKLYN, NEW YORK.

My Dear Girls:

This will have to be my last letter to you, for my vacation is over and in the life of a physician the time for letter-writing is difficult to find. I can not, however, close without a few words upon a subject of the utmost importance to you individually, and more so, if possible, to society and the world at large. It refers to the relation which girls and women bear to boys and men.

Our sex has passed through untold degradation and suffering since half-wild, primitive women, clasping new-born babes in their arms, sought shelter and safety in caves and even among the branches of

trees. It has come up through slavery and shame, through the dense darkness of ignorance to the noble position which is ours in the world to-day.

Two lights have shone upon the upward path which our race has trod; that which radiated from the little child, and in the fullness of time, the life and teachings of Christ. It was the primitive child that lured his father back from the chase to his mother's side, and the needs of the child gave birth to the industries of the world. It was in the interests of the boy-child, so important to the state, that woman's life was first made other than that of a drudge and a slave. Then came the new religion. The teachings of Christ and His followers, more than all else, lifted woman to her place beside man, established upon a solid basis the system of single marriage and the sacredness of the home. Unchastity was denounced, as

all men and women should denounce it to-day, and yet Christ manifested a loving tenderness and helpful kindness toward those who had fallen by the way—which we would do well to imitate.

Ah, girls, do you realize what a weary way woman has traveled to reach the place where at the marriage altar a man solemnly promises "In the sight of God" to love and cherish the one woman of his choice; to leave all others for her, and that, too, "as long as life shall last"? In view of all this there is a question I would earnestly ask *you.* What are you going to *do* with this precious inheritance of the ages? How are you going to fit yourselves to pass it on to the next generation?

In many respects men and women are different physically and mentally. Neither standing alone can carry on the world's work or elevate its standards. Together

we stand or fall, and the interdependence is so intimate and so far-reaching, that whatever conserves the good of one sex also conserves that of the other, and the evil indulged in by one drags down both. If we are to advance or even hold that which we have gained, the time has fully come to throw aside the double standard of morals for the sexes, which came down from the old days of barbarism.

Whatever is best for the child has proved to be best for the race, and whatever in morals is good and necessary for the child's mother is equally profitable to his father. When you marry, girls, therefore, be sure that the man you love has been taught this and will help you to teach it to your children. Thus and thus only can the next step toward a higher and truer morality be taken.

One word more. Have you ever thought that the man you will marry, if that hap-

piness is ever yours, is somewhere in the world to-day and is being influenced by the girls and women with whom he associates? Since he is to be the home-maker with whom you are to cooperate and the father of your children, I am sure you hope that every influence which surrounds him will be good and pure and helpful. Because of this, in all *your* relations with boys and men, be to them in every respect what you wish other girls to be to him who will be the supreme one in your life some day. Impersonate and promote purity and ever remember the words of the Master to the multitude of men, women and children upon the mountain-side of Gallilee, "Blessed are the pure ~~in heart~~, & chaste for ~~they shall see God~~."

With loving, good wishes, believe me your friend,

ELIZA M. MOSHER.

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